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AUSTRALIAN

BEE KEEPER'S

JOURNAL

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DECEMBER, 1885.

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EDITORIAL NOTICES, &c.

Preface.

THE desire often expressed among beekeepers in Australia, and Victoria in particular, for a journal devoted to the art of beekeeping and bee culture, and to advocating the commercial advantages to be derived from its cultivation and encouragement, has induced us to venture the issue of a periodical to be called the "Australian Beekeepers' Journal," which it is intended shall be published monthly. By its means we hope to lay before our readers every month an abstract of the proceedings of Beekeepers' Associations in various parts of Australia, the most important news concerning Apiculture from the world generally; the doings and discussions of the Victorian Beekeepers' Club, news from our various Colonial apiaries, accounts of improvements or inventions connected with Beekeeping, ventilation of questions concerning the market for Bee produce, and generally to inform and assist our readers in all matters pertaining to the subject. As a very great deal can be done in these directions by communications, questions, replies to queries, &c., from Beekeepers themselves, we intend to reserve a considerable part of our columns for contributions of this kind, and invite our friends engaged or interested in the art of Apiculture to communicate any information they may obtain likely to be of any use or interest to their brother Beekeepers. At the same time we ask "beginners" and others in want of information or in any difficulty, to write freely and unreservedly to the journal, in order that any of its readers or its Editors may reply to the questions and assist in spreading information and over-

coming difficulties to the best of their knowledge. We hope the journal will find its way to the hands of every Beekeeper, whether he be a cottager with his stock or two domiciled in a candle-box, gin-case, or other primitive hive, the dweller in a suburban villa keeping bees as a recreation, the regular bee farmer or the professed Apiculturist, and have therefore determined to issue at a very moderate price. We need scarcely say anything as to the want of such a journal, but we wish to point out that while the climates and conditions of Australia generally are much more favorable to Apiculture than those of many countries where it is carried on as an immense and very profitable undertaking, very little has yet been done towards making it an important industry in this part of the world, and but comparatively little is known of the special management and requirements in bee culture, which may be the most profitable under the particular conditions of climate and vegetation which exist in Australia. We have no experience of whether the black, the Italian, the Cyprian, the Holy Land bee is best suited to our condition or their adaptability to different parts of the Australian Continent. We have all to learn in this respect. Nor is much known of how best to manage bees most profitably, or of the best methods of marketing the products. We do know, however, what great loss is incurred every year, especially among cottagers by the barbarous and wasteful way in which hives are "robbed" in Autumn, and how much honey is rendered comparatively unmarketable by the ordinary way of separating it from the combs. In this direction especially we trust our journal may gradually bring about a reformation, and in issuing our first number we invite the assistance and co-operation of all

Beekeepers in the Australian Colonies to contribute towards the usefulness and continuance of the "Australian Beekeepers' Journal."

PROCEEDINGS OF BEEKEEPERS' SOCIETIES.

Victorian Beekeepers' Club.

SEVERAL gentlemen interested in Bee-culture, convened a meeting at the Duke of Rothsay Hotel, Elizabeth-street, Melbourne, and a number of persons known to be interested in bee-keeping throughout the colony, were invited by circular to attend, to consider the desirability of forming a Victorian Bee-keepers' Society. The meeting was held on 24th Sept., when it was agreed to form a society, to be called the *Victorian Beekeepers' Club*, the subscription to be ten shillings per annum for town, and five shillings for country members. At an adjourned meeting held at the same place, on 8th October, there was a large attendance, and numerous applications for admission to the Club. Three or four fundamental rules were provisionally adopted subject to revision after election of committee and office-bearers. It was agreed that the society should consist of members, associates and life-members, from which shall be elected annually a committee of seven members, they electing among themselves a president, vice-president, secretary and treasurer. Town members to be those residing within 12 miles of the General Post Office. It was decided to hold the first ordinary meeting of the club at 8 p.m., on Friday, 16th October.

The first meeting of the Victorian Beekeepers' Club took place on Friday, at 8 p.m., the 16th instant, at the rooms of the Royal Society, at which about 24 members were present. Mr. Ellery was elected to the chair. The first business was the election by ballot of a provisional committee to hold office until the first meeting in January, 1886: and Messrs. Barton, Kitchen, Ellery, the Rev. J. Kennedy, Messrs. Jackson, Lloyd, and MacLaine, were elected.

The Chairman called the attention of the meeting to some exhibits by Mr. Barton, consisting of a hive complete (the new British Beekeepers' Association Pattern), Edey's swarm arrestor, queen cages, metal spacers for frames, &c. Mr. Lloyd exhibited a splendid Berlepsch frame of pure Ligurians and queen in glass hive.

The question as to whether the club should adopt a standard frame to be generally recommended in the colony was raised, and a lengthy discussion ensued.

Mr. Barton moved that the English standard frame be adopted, but Mr. Clarke and others advocated the true Langstroth, that is 17 $\frac{1}{2}$ in. by 9 $\frac{1}{2}$ in. with a 19 in. top bar, for the reason it was already largely used in the colony, and had been found by long experience to be an excellent size. Objections were raised that owing to its large size the bees in weak stocks were more spread than in smaller frames, and that in the warm summers of Victoria combs would be apt to sag and drop if much loaded.

The Chairman said he had been using Langstroth frames with a centre vertical bar, which not only strengthened the frame but distributed the weight of the comb, and that by using a wire for a brace from one upper corner of the frame, down and over the bottom of the central vertical bar, a very strong frame was secured.

Mr. Clarke said he had used such frames which were thus made very strong—a trussed girder in fact.

Mr. Barton stated that an apiarist had informed him that he found great advantage from a centre horizontal bar. The opinion was very strong among the members that a standard should be adopted. The Chairman said it was most vexatious to find variations in sizes of Langstroth frames and hives made in the colonies; these were often small but sufficient to prevent exchanges of frames among hives. He had hives from New Zealand, South Australia, and Victoria, all differing a little, both in frames and boxes. There was, he said, only one true size for all these which should be rigidly adhered to.

The further consideration of this question was postponed till next meeting.

Questions were asked about where to obtain hives, bee appliances, books, &c., and several members gave information on these points. A member asked what was the best provision against ants getting into hives. Messrs. Clarke, Kennedy, and Kitchen contended that ants did no harm to bees or honey if the stocks were strong, but they might become an annoyance if stocks were weak. Mr. Kitchen stated he had seen in Queensland, hives in splendid condition exactly over large ants' nests, and lots of other nests about, and he could not ascertain, that the ants ever troubled the bees.

Several members said they always placed their hives on the ground, and had found no inconvenience from ants, while many bees, they believed, were saved by being able to crawl into the hives when falling near the hives, tired or chilled.

The date of the next meeting was fixed for Monday, 2nd November, at 8 p.m., at a place to be afterwards fixed and notified by advertisement.

South Australian Beekeepers' Club.

At a Meeting held at the Chamber of Manufactures on Thursday, 3rd September, a member of the committee read the following paper on "Swarming":—"The swarming of bees has been, I suppose, a familiar and noteworthy phenomenon to people of all ages and of all countries. The tumultuous rush of countless bees from a full hive, their circling and flight, and then the close clustering on the chosen spot, attract the attention and interest of all who may be fortunate enough to witness them; and doubtless many a man has commenced apiculture and the study of bee life by the unlooked-for capture of a stray swarm. I propose to-night to sketch shortly the apparent reasons for bees swarming; the extent to which the instinct should be encouraged; the indications of the approach of the season; and lastly, the procedure to be adopted in securing and hiving the emigrant bees; and in inviting your audience do not desire to pose as an authority on the matter, but rather as one who, with limited personal experience, has read the leading works on the subject and ventures to put before you its salient points for the better information of beginners, and as an opportunity of eliciting new facts and new methods from masters in bee culture. A healthy, full, and prosperous hive tends to swarm when spring is well advanced, provided that its capacity be not increased by the addition of section-boxes or other means. In the spring, when honey is coming in freely and the temperature is rising almost daily, the queen lays in every available empty cell, and the number of workers and drones increases rapidly. Ultimately there literally remains no work for the mature bees to perform, and no room to store honey. They must by emigrating, secure a new site for their energies. They must, to be of any use in the bee world, seek a new home. In springtime, then, the beekeeper will inspect his hive, lift out and examine the combs, and find out its exact condition. When drones are seen emerging in numbers about midday weekly, search should be made for queen cells, which are easily known by their large size and acorn-like form. Queen cells may, indeed, be formed and torn down again on a check in the income of honey or a change to cold and wet weather; but when they are seen in numbers, the weather being fine, and one or more sealed over, a swarm may be daily expected, for the queen mother does not await the appearance of a young queen, but anticipates the event by leaving with a large majority of the adult bees. Shortly before a

swarm issues it is said that the bees cease working to some extent, and hang about the entrance, apparently in an aimless way. Still, it is certain that they may swarm off suddenly without any previous outward demonstration of their intentions. The first swarm from a strong hive is the strongest, and consists of perhaps ten or fifteen thousand bees, including the old queen, drones, and both old and young worker bees, there being left in the hive a preponderance of young workers, and combs full of maturing larvæ in all stages, including perhaps a dozen hatching queens. In seven or eight days one of these queens will emerge from her cell, and another swarm may issue about two days after—that is, from nine to ten days after the departure of the first swarm. By listening closely at a hive about to cast a second swarm the young queen may be heard at intervals uttering a characteristic piping cry. This note announces the probability of the second swarm issuing on the ensuing day. There may follow at intervals of a few days other swarms, even up to four or five, but I think the number is generally limited to two or three, and certainly if that number be exceeded the later swarms will be small and the parent hive be weakened to an undesirable extent. The first swarm is usually a very strong one, and suitably hived will frequently go into winter quarters quite as strong as the parent hive, after gathering as large a surplus and even in very good seasons and localities swarming again itself late in the season.

With reference to the extent to which the swarming instinct should be encouraged, there will perhaps always be a diversity of opinion, and it is certain that a method which will suit in one locality or be desirable one year may be of but doubtful advantage under other conditions. Thus the owner of a strong hive, especially if his bees are true Italians, may desire to increase his numbers rapidly, and given a good season with abundance of indigenous or other flowering plants, will not go far wrong in allowing his parent hive to swarm without hindrance; but he must not be disappointed if his aggregate honey harvest is a moderate one for that season. The apiarist, on the other hand, who proposes rather to have two or three strong hives, producing each of them the maximum amount of surplus honey, either in boxes or for the extractor, will limit his hives to one swarm each, and rest well content if at the close of the season he has good strong colonies all round and a copious store in his honey-house.

This latter method, that of limiting the issue of swarms to the first one only, will, I think, find favour with the majority in average localities,

and it is certainly more desirable economically to keep a moderate number of strong colonies producing good surplus than to possess numerous small or even weak colonies, many of them gathering barely enough for their own sustenance, providing no surplus, liable to decay in a bad season, subject also to the successful onslaught of robbers, and requiring too as much expenditure in material and oversight as the most prosperous hive. There is perhaps no error into which the inexperienced beekeeper is more prone to fall than of injudiciously increasing the number of his colonies without direct reference to their individual strength. Better by far for satisfactory results, both to the bees and himself, is one hive teeming with strong healthy workers constantly putting by surplus than a dozen weaklings struggling along for a scanty subsistence. The man with Italians, however, occupies just now an exceptional position, and it may pay him to have many Italian swarms, even though they be weak and little more than nuclei.

To prevent swarming altogether is a difficult and sometimes impossible task without so checking the work of the hive as to damage its prosperity. Do what you may you cannot assure yourself that the instinct has been more than temporarily suppressed. However, swarming may be hindered and delayed by frequent extracting, and by keeping an empty comb in the centre of the hive. Should one swarm have already issued, casts may be prevented by removing from the old hive on the seventh day thereafter all queen cells but one; or, preferably, all the queen cells, careful search being also made for any young and recently emerged queens. Should all queen cells be removed a laying queen may with safety be introduced on the following day after smoking, and such an opportunity is a capital one for the introduction of an Italian queen to a black stock.

Our first swarm, then, is issuing from the crowded hive, and this will generally take place on a fine day any time almost after sunrise, but preferably when the sun is well up; the bees pour out pell-mell, apparently in wild disorder, and, rising gradually, wheel round, ever circling higher, and, forming a more or less compact cloud, generally settle without more ado on a neighbouring tree or bush, or even on the ground. The queen being with them they hang in a compact cluster and usually remain so for hours, but if not hived will eventually, as they may do in the first instance, rise high in the air, and go off rapidly to some inaccessible spot, perhaps to some hollow tree. The first swarm being accompanied by the old and heavy queen mother, is not likely to

take a long flight. To secure this swarm, one may make sure it will not depart utterly by previously clipping one of the queen's wings, for she will not then quit the immediate vicinity of the hive, and may be picked up from the ground, caged and used as a decoy for the swarm to enter the new hive. But otherwise, should the swarm seem indisposed to settle, they may be induced to do so by syringing with water, or, better, by throwing dust in the air, and this latter method has the merit of age, for it is recommended by Virgil in the Georgics. The swarm once clustered should be secured without delay.

Your frame hive is ready with narrow strips of foundation. You take a small candle-box, a chip hatbox, a large tin, or any other suitable tight vessel—a hatbox is as handy as anything—and placing it under the hanging swarm, suddenly jerk or sweep the majority of them in at one swoop. A white sheet spread on the ground beneath the place of clustering has the frame hive standing on it, slightly raised from the bottom board should the entrance be small. Empty your bees out on a cloth near the entrance, and they will speedily seek the welcome shelter. Once in, remove the hive to its future stand without delay, otherwise the bees will continue to return in considerable numbers to the place of swarming, to their very considerable confusion and loss. Next day it is desirable to inspect the new hive to ascertain how many frames are required by the bees, and any superfluous frames being removed, a division-board may be placed beside the cluster, and should one have a hive from which a swarm is not desired, and which is very strong in brood, a frame from it may be given to the new colony. I will not touch on the various procedures used for preventing swarms by building up new hives with frames of brood taken out of the established colonies, as a subsequent evening will be devoted to that and kindred methods. If secondary or even later swarms are secured—which, from their small size, have little chance of becoming prosperous—they may be deprived of their queen by capture and allowed to return to the parent hive; or two or more of them may, (the supernumerary queens having been removed) be confined, after liberal smoking or sprinkling with scented honey and water. Should these small swarms have been hived, and then proved to be undesirably feeble, they may be united, care being taken to approximate the forces gradually during the preceding day or two. I have treated my subject purposely in but a fragmentary manner, and anticipate that members present will contribute from their more extensive experience such information as they have bearing on the matter."

The Chairman, in congratulating the members upon the excellent paper submitted, remarked that he had lost a second or third swarm after "taking" it in a box, and he wished to know how such an accident could be prevented. A member suggested that it might have been caused by some offensive odour in the box, and another said that if a piece brood comb were put in the hive it would never fail to keep them in. One said that he had heard that a perfectly clean hive would keep the bees in, and especially if some fennel or other odorous herb were rubbed on the inside. The Secretary objected to the use of any scents, and found that it invariably caused the bees to attack him. He had found that it was by far the best plan to let the first swarmings take place. Then the swarm has to be taken in a light box or basket, and thrown down in front of the new hive, taking care of the queen. Another member never threw his bees down in front, but took off the top of the new hive, threw the swarm on top, and they always went in, after taking out one or two of the frames perhaps. Mr. Liddle raised the question whether an owner could follow a swarm into a neighbour's property. A legal member stated that, in his opinion, a person could not follow a swarm in this manner, but the adjoining owner would not be allowed to take the swarm. Another member stated that a case had been tried in one of the country districts and decided in favour of the original owner, but this was stated to be no authority. The opinion of many was that the British law prevailed here, and that any owner was allowed to pursue his bees. It was stated that the American Government was adopting strongly protective laws in the interests of owners of bees and securing their rights in swarms.

A number of questions were submitted and answered by various members. The first was—Is it necessary to cure honey by exposure to the air, when it is being rapidly taken out by the extractor? The members thought that the eucalyptus honey was ripe even when gathered only for a day or two. Some members, however, maintained that when honey was not sealed it required to be exposed in the air for three or four days in a properly constructed cistern. The honey was thin at first, but after two days it became of the ordinary density. In cold climates it was necessary to heat the honey, but it was not needed in this climate. In respect to the time for putting on section-boxes some members would put them on at once if honey were coming in freely. They would not take any frames out for extraction whilst the section-boxes were being fitted. It was strongly recommended that the members should try the reversible frames,

which had the effect of forcing the bees to store in the section-boxes above. A member said he had tried to establish a frame with all the adhering bees in a nucleus hive, but after a couple of days they were attacked by dysentery, and he wanted to know the cause. The only solution arrived it seemed to be that the bees were too cold. Several minor questions were asked and replied to, and the meeting separated.

The Honeycomb Company, Limited.

THIS company has recently passed the ordeal of its first half-yearly meeting. It is an outcome of the "Beekeepers' Association of Victoria" that was formed in September, 1884, enrolling 67 members, resident in almost all parts of the colony, and in Tasmania. The association, though now practically defunct, did good service by numerous meetings, and some lectures, and was well supported by the press. The *Leader* especially awakened, in fact, a widespread interest, and diffused valuable information.

The merely abstract and theoretical, beginning as usual to lose its interest, a few gentlemen determined to try the effect of a quasi-commercial experiment, and accordingly "floated" the company at a cost of £64 16s. 7d., all charges for first six months included, managing withal to store 9223lb. honeycomb and 9864lb. strained honey, each class of first quality; some vendors having taken shares in part payment.

The stock is being sold at prices that will yield a dividend to shareholders, but the object steadily pursued is the development of apiculture in Victoria and Tasmania, according to the best methods. The company is pledged to bring within the reach of all the latest appliances at prices which they can afford to pay.

It is confidently anticipated that this course will enlist the sympathies of those who believe in the importance of apiculture, and will also secure the confidence of apiarists, not only by catering for their wants, but by affording a ready market at fair prices for all they can raise. Attention is called to the company's announcements in our advertising columns.

ORIGINAL CONTRIBUTIONS.

Beekeeping.

By W. ABRAM, MANAGER OF THE ITALIAN BEE COMPANY, PARAMATTA, N.S.W.

INTRODUCTION.

No insect is so interesting and so worthy of general attention as the Honey Bee. Its unrivalled industry sets us an example which

we might well imitate with advantage to ourselves, while the study of its nature, habits, and internal economy is one that ever affords new pleasures to all who engage therein, and when we add that Beekeeping not only delights the fancy of the enthusiastic amateur, but under good management has proved a most profitable speculation, it is surprising that so few in this land of flowers have taken up the matter in a practical way.

We have now all the latest improvements and information in connection with Apiculture, and since the system of Frame Hives has been introduced, the working of an apiary can be carried on in such a simple and methodical manner that with a little theoretical knowledge and some practical experience, any one who has a taste for this pursuit can commence the undertaking with every prospect of success.

In various countries in Europe and also in America, where many difficulties, such as long cold winters, have to be contended with, Beekeeping has been carried out on a most extensive scale, and with most satisfactory results, then why should not we take advantage of the experience of others and enter forthwith upon a pursuit at once so full of pleasure and profit. We have Agricultural Societies, we have Poultry Exhibitions, &c. &c., then why might we not have a Society for the promotion of Apiculture, and later on hold Exhibitions of these wonderful little Artificers and their products. There is nothing to prevent every cottager throughout the country having his apiary if he wish, as our genial climate is most suitable for Bee culture, and the cost of a few hives to make a start is so small that it is within the reach of all; there is no rent, no labor or raw material to pay for, and the industrious little laborers are ever eager to put forth their whole strength to collect their stores for the benefit of their owner, neither do they ever strike for wages, and they provide their own subsistence.

I am pleased to notice that there is a great desire springing up for information as to the proper treatment, &c., of Bees, which is proved by the many hundreds of letters I receive from every part of Australia, and it is with a view of satisfying this desire that I purpose publishing a few short articles, which are intended as a guide to the Beginner by giving him briefly some theoretical and practical hints which may assist him in bringing his efforts in beekeeping to a successful issue.

The term Hive is used generally for every kind of contrivance made for the habitation of the Bee.

A hive with Bees and Comb complete is

termed a Stock Hive.

Bees without a Hive or Comb are designated a Colony.

A complete Colony consists of the Queen, Working Bees, and Drones.

A new Colony is termed a Swarm.

A Colony contains one Queen only, except at swarming time (and in some very rare cases) the greater number being Workers, and the remainder Drones. The comb which is used for rearing brood, storing honey and pollen, contains cells of three distinct kinds, viz., Worker, Drone, and Queen cells. These are easily distinguished from each other, the Drone cells being much larger than those of the Working Bee cells, while the Queen cells are of a different shape, being something like the cup of an acorn inverted and very few in number. The Drone and Worker cells, when not required for brood, are used indiscriminately for storing honey and pollen.

THE QUEEN.

I shall proceed first to describe the Queen, she being the most important personage in the community as upon her depends not only the prosperity, but the very existence of the Colony. That the bees feel this and thoroughly understand her value is evident by the respect, homage and love they bestow upon her; they caress, feed, and protect her; and no matter how crowded they may be, they open a way for her, as she moves along fulfilling her maternal duties, and when her loss is perceived they rush about, seeking her both inside and outside the entrance of the hive, giving forth a most doleful lament: should the watchful bee-master perceive this he ought at once to endeavour to repair their loss if possible, by giving them a new Queen, and if he cannot do this, should the accident occur during the winter season when there is little or no brood in the hive, the consequences will be fatal; but if it happen in the breeding season nature has endowed these wonderful insects with the power of producing a new Queen themselves in the following manner: The bees select one or more Worker larvæ not more than four days old, and breaking down the surrounding cells make an artificial Queen cell, and then proceed to feed the Embryo with specially prepared food called by naturalists "Royal Jelly," and in due time a Royal Virgin is produced. In further explanation of the above we may here state that Queens and Worker bees are all of the female sex, and from any working bee's egg or larvæ three or four days old, a Queen can be raised, as already mentioned, and it is only in their development that the difference arises. The Queen cells are of two kinds, Swarm and Artificial. The first are begun by the bees

when they want to raise a young Queen in the ordinary way with a view to swarming, and are larger than the Worker cells and hang downwards. In these partly made cells the Queen deposits female eggs, which after two days develop into larvæ, after which they get plenty of prepared food (Royal Jelly) and these cells are gradually lengthened, from the laying of the eggs, till on the fifth or sixth day, having nearly filled the cells with food they are capped or closed; the Queenly larvæ then gradually develop into a Nymph which emerges from its prison in fourteen to sixteen days from the date the egg was laid, the better food bringing it to maturity much quicker than the working bee, which requires twenty to twenty-one days to bring it to perfection. It is not difficult to discern the Queen from the rest of the bees, as she is much larger, the after part of the body longer, while her wings are comparatively shorter, her legs, particularly her hind legs, are longer, but have not the brushes or baskets like those of the Worker bee (these not being required as she has not to seek her own food), and her abdomen tapers to a point. But not only in her outward appearance does the Queen differ from the others but in her internal organisation; as the larger cell and the Royal food render the reproductive or genital parts perfect and capable of impregnation by the Drone which must take place within the first five or six weeks, as after that period she will be incapable of being fertilised; one impregnation is sufficient, and with very few exceptions lasts during her whole life.

Her intercourse with the Drone takes place outside the hive, so she must be strong and well winged, and there must be plenty of Drones about, else the occasion may be lost; her wedding trip always takes place during the warm hours of the day between twelve and five o'clock in the afternoon, which is the time the Drones take their daily flight. Her marriage having been consummated her Majesty returns to the hive to the great delight of her subjects, and unlike the most of them, remains at home, and after two or three days commences to lay her eggs, which fully occupies her time and she never seeks to roam again except when she goes forth to lead a swarm and form a new Colony.

I might here briefly describe the peculiar and wonderful internal organisation or development of a fertilised Queen. By her connection with the Drone, she receives the male or fertilising sperm in a receptacle where it is held, as it were in suspense or germ life, until required for fertilising the eggs. The eggs are produced in a double egg vessel, and when mature pass into the egg canal, to which

a small pipe from the sperm receptacle leads. When she wishes to lay eggs for Worker bees she discharges from the receptacle into the eggs the necessary quantity of the sperm, but when this is not done the eggs produce Drones, so that she can arbitrarily deposit either Worker or Drone eggs at will. From this it would appear that even unfertilised Queens; nay more, that a Worker bee in a Queenless hive may have the power of laying eggs, but of such eggs Drones would be the produce, although deposited in a Worker or Queen cell. Such unimpregnated Queens only begin to lay after their flight, when they have been unsuccessful in meeting a Drone, or when their flight has been too long delayed and although the bees may feed her on the choicest food, no Queens can be raised, exhibiting the strange natural phenomenon that the life germ of the female sex is generated in the male, while that of the male has its origin with the female.

The Queen, like the working bee, is provided with a sting, but this she only uses in combat with another Queen, as she will admit of no rival to her throne, and except at swarming time a second Queen is rarely found in a colony, and in fact one of the first acts of her life is to search for and try to destroy any pupæ of princesses that are likely to be antagonistic to her sovereignty.

WORKERS.

THE Worker Bees, which are the smallest of the three, are produced in the small six-cornered cells, and their development takes 20 to 21 days, are in reality undeveloped females, and although from this defect it is not their vocation to lay eggs and reproduce their kind, their duties nevertheless are not much less important, and are certainly equally onerous and necessary; the whole working of the establishment both in and out of doors, devolves upon them, and almost from the moment of their birth their life is one of unceasing labour of various kinds, some of which require much skill and forethought. These they so cheerfully and untiringly perform that their industry has been extolled as well worthy of imitation by poet and philosopher from the days of Aristotle and Virgil down to those of Dr. Watts. They build the combs, they go abroad to seek the sweet nectar, and when obtained bring it home, store it in the cells prepared for it, they get the pollen and feed the larvæ, nurse and cap them, they clean and feed the young bees when hatched, thus taking upon them all a mother's cares and responsibilities. They clear away the dirt and rubbish from the hive, they guard and protect it against all invasions of their many enemies of various kinds, and are ready to

lay down their life in its defence, their only but dangerous weapon being their poisoned sting, which they fearlessly use when required, although its loss is almost invariably the consequence, as it is barbed, and can seldom be withdrawn by them, and when they return home without it their life is the forfeit.

A good healthy colony in the summer season should contain from 30,000 to 40,000 workers, and the stronger the hive is in this respect the better and more profitable, as instead of the greater numbers inducing laziness or rest, it seems to stimulate their energies, and thus produces a larger yield to the Beemaster.

DRONES.

THE Drone, or Male, differs greatly from both the Queen and the Working Bee. They are larger, the body is rounder, and the abdomen not so pointed as that of the Queens or Workers, and they have a loud hum when flying. They are reared in the larger or Drone cells in the manner already mentioned in my description of the Queen, and require 23 or 24 days for hatching. The caps of the brood cells are high and convex, and they are sometimes termed humped or hump back brood when laid in worker cells by an unfertilised Queen. The sole purpose of their existence is for the impregnation of the Queen, and they take no part in the labours of the community, consequently they have received the appellation of Lazy Drones. Unlike the male of most creatures they are the weakest and most helpless, as they have no sting to defend themselves, and no natural appliances for procuring their own subsistence. They are only produced during the summer months in anticipation of swarms for the impregnation of the Virgin Queens, and when the swarming period is past, as they are no longer required, they are destroyed by the other bees, in order that they may not consume the stores of the hive during the winter. However, when a hive is Queenless, they are generally kept for some time longer if the bees are trying to raise a new Queen. In a large hive there may be one or two thousand Drones, which may appear far too great a number of these comparatively useless idlers, but this is a wise provision of nature as it is a matter of great importance that the Queen should be certain of meeting soon with a mate when taking her flight. She is not so active as the others, and her absence from the hive should be as short as possible as she runs the risk of accidents from birds or other causes.

The Drone who chances to meet with the Queen is an unlucky bridegroom, as his marriage-day is also that of his death, while his widow returns and commences her maternal duties apparently unconcerned for

the loss of her royal consort, but unlike many widows she remains faithful to his memory to the end of her days. I should here call attention to the fact that sometimes if bees are allowed to breed as many drones as they like, they do so in great numbers, which of necessity causes a great and useless waste of the honey stores; and this requires the attention of the watchful Beemaster, who should remove from the hive a portion of the Drone combs to put a stop to their excessive production. The Italian Bees, however, breed less these idlers.

THE FOOD OF THE BEES.

HONEY, pollen, and water form the principal nutriment on which the Bees subsist. Pollen, according to more recent analyses, consists of starch with fatty and other very nitrogenous constituents, and honey, though not yet accurately analysed, appears to contain sugar, mucilage, and acid. The matters are necessary for the formation and nourishment of the Bee. The honey is carried home in the honey-sac, with which all Working Bees are provided by Nature, and from that transferred to the cells; when they take it from the honey-bag into the stomach they use it mixed with pollen for their own food or for feeding the young brood; when they wish to build combs they take more honey into their stomach and there digest it for about forty-eight hours, after which it exudes and forms small leaves of wax on their abdominal rings, and then it is ready for use. Honey alone is required for this formation of wax and it takes 10lbs. of honey to produce 1lb. of the wax from which the combs are constructed, but to make pure, clean wax 20lbs. of honey are requisite.

The pollen is carried by the Bees in the baskets or grooves on their hind legs which Nature has provided for the purpose, and when they wish to lay by a store of it they pack it tightly in the cells, sometimes filling up with honey and then closing up the cell. Pollen is only used mixed with honey and water for food, and has no part in the composition of wax as many persons erroneously believe.

(To be continued.)

How I Caught and Robbed my First Hive.

BY A NOVICE.

ONE fine Sunday morning I was starting out from my residence in the suburbs to dine with a friend in town, when I was apprized of the fact that there was a very peculiar cluster of flies hanging on a rosebush in the garden. Having inspected the cluster, I came to the

conclusion that it was a swarm of bees, when the whole family became seized with excitement as to how they were to be caught, and, as none of us had ever seen a swarm before, various were the suggestions made. However, a happy thought took possession of us. Our maid came from Echuca, or rather from the bush in that direction. Had she ever caught bees? She had, as she told us in answer to the query. Oh, yes, we used to catch them and put them into a pickle bottle, but they wouldn't stop, so that style of living did not suit. But some of us had heard that if we got a box, stick a stick through it and smeared the sides inside with cream and sugar they would go in; but that did not answer. So being in a hurry to go, and having an idea that I might cut off the branch and so put them in, I essayed to do it, but an accidental knock with the saw settled the matter by shaking nearly all the cluster off the bough into the box, which was put under to catch the branch when it fell. So I turned it over, got another box to stand it on, and the job was finished. How we were brave enough to face such a job was a marvel afterwards, and, what was more remarkable, none of us got a sting. Well, having got the bees, in due time we wanted the honey. Various were the people interviewed and questions asked. How shall we get the honey? When is the time? What hour in the day? &c. So having found in answer that we had to get another box and place on the one containing the bees, having previously inverted it, and to start at dusk. One evening in December we essayed to accomplish the task. Turned up the box of bees, placed the other on it, put a cloth round to keep the bees in, and commenced hammering the lower box. In about five minutes, moving suddenly, I felt something like a thorn from a rosebush sticking in my leg behind. Gave a kick to clear the branch away, when a host of other thorns began to stick, and I discovered my mistake and found the thorns were stings and a number of bees crawling up my leg. It was now getting dark, so I hurried in, had a light brought, and got some of the stings extracted and made a fresh start, when somehow the cloth got off from round the boxes, put my hand over the hole in my excitement with a result more painful than pleasant. However, still persevered, placed the new box on the old stand, got a light, for it was now quite dark, and tried to get the honey; found the bees had not all gone, so having heard smoke was a good thing to shift them with, procured some rags and commenced smoking them out, but instead of coming out they all went further in. Began to get discouraged but thought if I took the box to pieces I would get along better, so

ripped off the side, threw it down, and moved on, took out some comb, got the bees nearly all off and moved on again, finally leaving the box in pieces strewn on the course, moved, together with bees, comb, honey, and burning rags, with net result about 2lbs. of honey, and stings beyond count, thus ended our first experience of bee-keeping. But we have altered all that now, for, from that swarm we have about thirty hives on the moveable frame system and are still increasing our numbers, and as a moral would advise all intending bee-keepers to have the same pattern and never rob bees at night.

CORRESPONDENCE.

(To the Editor of the Bee Journal.)

DEAR SIR,—In my estimation there is nothing more capable of advancing the interests of beekeeping than a bee journal. Periodical meetings are certainly inestimable, but they cannot often be frequented by members who live at a distance. Not so with the journal, for every one may read it who wishes. It often happens that I meet with incidents which I should like to communicate to my fellow-beekeepers, so that I may hear their opinion on certain subjects; but in absence of a journal it cannot be done. For instance, something happened in my apiary only a few days ago. It was a very hot day, the bees were swarming, and a great number were attracted by a stove pipe. As there was fire in at the time I endeavoured to dislodge them by directing a stream of water there, but in vain. As the next morning the fire would not burn, on examining the pipe I found it was literally choked with dead bees. I do not know what attracted them, unless it was melted wax and resin on the stove.

Another little, but very interesting, incident occurred to me at queen-rearing. I had inserted a nearly matured cell into a hive which I had made previously queenless, but had omitted the day of insertion. I knew that the young queen was alive in the cell from the sound. I waited several days, and as she did not make her appearance I concluded that she was now dead in the cell. I took out the frame, intending to remove the cell, but as soon as the knife touched the royal cradle the young princess began to pipe so loud that I knew at once she was alive and well. I opened the lid, she crawled into my hand, and was immediately introduced to her waiting subjects.

Another occurrence took place on this wise. One day I caged a queen, with the intent to breed a better one. Just a week after, when I about to remove the cage, I found the queen dead in it. This astonished me. I searched

the hive and found eggs and larvæ in the cells. At first I supposed this to be the result of a fertile worker, but it was not, for I soon discovered a beautiful young Italian queen in the hive, but how she got there I do not know. But as I rear a great number of queens this season it is possible that a young queen after taking her wedding trip, went into the wrong hive, and as the queen of the hive was then caged the stranger was well received.

There is just another very practical observation I only made to-day, and it is this: It frequently happens when nucleus-making is carried on to a considerable extent that the bees leave their artificially-made home and return to the parent hive, and thus the brood gets chilled, and if this is not soon discovered by the apiarist it gets so bad that the combs are unfit for further use. It often occurred to me, and I was at times perplexed how to clean these combs. Only last night I left one such frame full of brood dead in the cells exposed in my garden, and in the morning I found the side which was exposed perfectly clean and not a single cell destroyed. Now, who cleaned it is the question? It was the otherwise much persecuted predator of the feathery tribe—"Mr. Sparrow."

H. NAVEAU.

Hamilton, 3rd November.

To the Editor of the Beekeepers' Journal.

SIR,—It would be very interesting as well as useful, if you could prevail upon beekeepers' in Australia to observe what plants (native or otherwise) are much visited by bees, and to communicate their observations to the *Beekeepers' Journal*. The observation should show whether bees took pollen or honey, or both, from any particular plant, the month in which they were found to visit the plant, and also whether the bees were the common, Italian, or hybrid; either a common or the botanical name of the plant should be also given.

In that very valuable little work by Baron Von Mueller, K.M.G., "Extra Tropical Plants for Economic Culture," the author gives at the end, page 368, a list of Genera of the principal honey-bearing, or bee plants, as follows:—"Acacia, Agave (aloe,) Brassica (cabbage tribe,) Citrus (orange and lemon,) Eucalyptus, Eucryphia, Helianthus (sun flower,) Lavendula (lavender,) Medicago (lucerne,) Melianthus (honey flower,) Melissa (balm plant,) Mentha (mint,) Origanum (marjoram,) Rosa (the rose tribe,) Rosinarius (rosemary,) Salvia (sage,) Thymus (thyme,) Tilia (the lime or linden tree and bass wood of America,) Trifolium

(clovers,) Tropæolum (nasturtium,) Viola (violets, pansies," &c.)

I have carefully noted the last two seasons plants that were freely visited by bees, but only in one or two instances have I seen plants visited by Italian bees only, and those plants were the Red Dutch Clover and one of the deep-flowered Veronicas, the specific name of which I have not yet ascertained. All the veronicas are favourites with the bees in autumn, and they yield a good deal of honey. The much despised Cape Weed (*Cryptostemma Calendulaceum*.) furnishes an immense pollen supply, and bees come home literally bathed in it. This harvest comes just at the time when most required, that is, a little before and at first swarming time. The Watsonias give a rich supply of pollen of a deep orange red colour, and the bees take this very eagerly.

Nearly all the polygalas (milkworts) supply both honey and pollen, and that handsome shrub, *Podylaria Styraefolia*, is alive with bees on mornings in September and October. This plant, however, is surpassed both in its honey yielding qualities and its attractiveness to our friends by the well-known bee plant, "Viper's Bugloss," or *Echium Candicans*, of which every beekeeper should have as much as he can.

Contrary to my expectations, I found that the ordinary *Pittosporum* (*P. Undulatum*.) was but sparingly visited this season. The dark purple blossom of the *Pittosporum Nigrum*, however, appeared to be an immense favourite, with the Italians especially, and I think it was for honey they visited them.

The *Cistus* (rock rose) appears to be a great favourite in October and November, and yields both pollen (in plenty) and honey. The scarlet bottle brushes (*Callistemon speciosum* and *regidum*) are splendid bee plants, and supply both pollen and honey, but the latter most abundantly. They continue in blossom for a considerable time, commencing in November.

Of course it is unnecessary to refer to the well-known bee plants of our gardens, such as corn flowers, wallflower, mignonette, cabbage, and turnip blossom, and nearly all fruit blossoms, although it would be of interest to ascertain if these are of the same value to bees as they are in other climates.

The now common ornamental tree, known as the pepper tree (*schinus molle*.) seems also to be a great favourite, and the hum around one of these on a fine morning is evidence enough of the fact; but whether it yields pollen or honey or both, I have not yet satisfied myself.—I remain, yours,

SIGMA.

To the Editor of the Australian Beekeepers' Journal.

SIR,—Now that a Beekeepers' Club has been formed, and it is probable that bee-keeping on modern principles will soon be the rule, I desire to discuss in your columns the question concerning the size of the frame to be adopted by the Australian Beekeepers' Club.

I regard this question as an all-important one, and I think the club should pause before deciding this question hastily.

In discussing this question, I should like to distinguish between hives and frames. Whatever sized frame is eventually adopted, the hives, whether made on the Langstroth or British Association patterns, could, I apprehend, be made internally to suit the one or the other frame.

Those advocating the Langstroth frame, $17\frac{1}{2}$ inches by $9\frac{1}{8}$ inches, do so on several grounds, namely, (1) That most people in the colony have got them. (2) That the Langstroth *hive* is the best. (3) That this frame is universally adopted by American beekeepers, who are far ahead of anyone else in bee-keeping.

With regard to the first ground that most people have it, if it can be shewn that this frame is too large for all purposes, I submit it is a very bad reason for adopting it.

Secondly, that the Langstroth *hive* is the best, this I admit, but why not have the Langstroth hive and a smaller frame.

Thirdly, the Langstroth frame may be admirably suited for America, but quite unsuitable to Australia, and with regard to the Americans being far ahead of the English, I would point out that in one instance the English are ahead of the Americans, I refer to the metal ends for spacing frames and preventing propolis. This admirable invention is, I believe, due to an Englishman, and I can find no mention of it in any of the American books I have seen.

I learn also from advocates of the Langstroth frame, that in many cases a central bar either vertical or horizontal (the former preferred) has been introduced to strengthen the frames and also to halve the weight of the heavily laden combs. The British Beekeepers' Association standard frame, 14 inches by $8\frac{1}{2}$ inches, requires no central bar, it has been universally adopted throughout England after a very careful and rigid trial of all other sizes of frames.

If this frame were adopted all Langstroth frames now in use could easily be cut down to the size.

What I would advocate then is shortly this. The Langstroth hive made to fit the British standard frame.—I am, &c.,

DRONE COMB.

NEW BOOKS, REVIEWS, AND EXTRACTS FROM FOREIGN JOURNALS.

Australian Notes.

SOME American apiarists are finding out that the common black or brown bees have most valuable characteristics for the apiarian as compared with Italians and other varieties. They enumerate the chief points in the characters of blacks and Italians as follows:—The Italians are indefatigable workers, very gentle, but less easily cowed than blacks, are more vigorous and determined when roused, guard their homes against robber bees, moths, ants, and other intruders, better than the blacks; they store honey and raise brood well and rapidly. They are, however, very prone to swarming fever, and cannot be controlled in this respect so easily as blacks or cross breeds, so that they require a good deal of watching at swarming time. Their comb is much yellower in colour when new than the black bees. In capping the honey they *fill the cell full*, and a section box of capped honey looks very yellow and comparatively coarse as compared with the beautiful white comb of our black friends, in which a little particle of air left between the honey and the cap, adds to the white appearance.

The blacks defend their homes but weakly, are more prone to moth than Italians, and more likely to start robbing. They are, however, easily managed, quieted with a very little smoke, store honey as rapidly as the others, and are found to be very superior to Italians for their readiness to work into section boxes, building generally nice clear white comb. In handling them when smoke has to be used they are rather apt to get *awfully frightened*, and tumble about in helpless heaps, which is often troublesome. Some Italian stocks are so gentle that one can without smoke lift out and examine frame after frame full of bees, and not one will *go for you* so long as you do not pinch or jar them; if you do they are no longer gentle. The blacks are certainly better than Italians for queen rearing.

I have had more stings from Italians than other bees, because I gave them too much credit; and, taking all in all, I think blacks are as easily handled as Italians, but some, certainly not all, of the crosses between these are about as peppery as bees can be.

Foul Brood.

In the journal of the Royal Microscopical Society for August is a valuable contribution by Messrs. Cheshire and Cheyne on this disease of Bees, which altogether upsets the old views concerning its character.

It has always been supposed to be a disease confined to the brood and not effecting the bees or the queen, but the investigations of these gentlemen show it to be a germ disease, affecting all the inhabitants of the hive and rapidly destroying all the brood. It is due to the presence of a germ known as *Bacillus*, and they have named this particular one the *Bacillus Alvei* (from *Alveus*—a Beehive.)

This disease then may be now regarded as specific germ disease like the well known and dreaded silkworm disease, and instead of its being a disease originating in and confined to the brood, it is communicated to it by the bees themselves, and indeed the very eggs deposited by the queen are found to be infected with these germs.

But what most practically concerns the beekeeper is the cure which Mr. Cheshire has discovered for this hitherto incurable disease—it is simply to feed the infected bees on Syrup in which one part by weight of *absolute phenol* is added to 500 parts of syrup. This food is poured over the combs affected so that it runs into the cells. Mr. Cheshire states that the very worst cases were cured in this way, except where the Queen herself had become badly diseased.

Queries and Replies.

QUERY NO 1.—Would some of your correspondents state what is the latest dates at which swarms may be expected in this part of Australia, and also if after swarms have ever been known to issue after sunset in Victoria.

JERL.

QUERY NO. 2.—Have any Victorian beekeepers been troubled with moth, if so, at what time of year?

J.B.

QUERY NO. 3.—The yellow flowering weed known in England as Catlock or Keltock is pretty plentiful among some of the grain crops this year. Can any of our correspondents give information as to whether bees work on it here as freely as in the old country.

O. M.

QUERY NO. 4.—In some of my Italian stocks I find quite a number of small bees among the young ones, very much smaller and blacker than the others, many of which are killed or carried away by the others. Can any of your readers explain the presence of these apparently dwarf bees?

T. J.

QUERY NO. 5.—Would you kindly inform me what is the best bee-book to get for a beginner, what is the cost, and where can it be obtained?

J. G. E.

QUERY NO. 6.—Can you help me in my trouble? I made two Nucleus swarms as I wanted to have a couple of queens on hand during the honey season to introduce after

swarming, or should anything happen to any of my queens. I gave them a sheet of brood, and in due course the queens were hatched. I examined them each day and found them progressing well, but on about the fifth day I found in both cases that the bees all left, the only way that I can explain it is, that the bees went out with the queen on her virgin flight. Curious to relate about a week after they left I was surprised to find one evening one of them hanging on a tree close to their old location.

PUZZLED.

Replies to Queries.

No. 6.—It is very often the case that bees do swarm out with the queen when she goes for her flight, but it can be prevented by giving them a comb of *unsealed brood* when the young queen has hatched out, the bees seldom leaving when this is done. It is a curious fact that after swarming out in this manner bees often return to their old locality should they not be able to find a suitable place as a new home.

Ed.

NOTES AND NEWS.

SIZES OF LANGSTROTH AND SIMPLICITY HIVES AND FRAMES.

THE Langstroth and Simplicity hives are now made of the same internal dimensions, viz.:—Brood chamber 18½ in. long, 14½ in. broad, and 10 in. high, and the rabbet for ends of frames to rest on are ¾ in. high and ¾ in. wide. The box for a half-story is of the same size as the brood box, but 5 in. instead of 10 in. high. The roof has generally been made as a separate piece, but in the Simplicity hives the roof and half-story are in one piece. The frames are of the following size, outside measure, namely:—17½ in. long, and 9½ in. deep. The top bar is either 19 in. or 19½ in. long, so as to give projections for hanging either ¾ in. or full 5-16 in. Frames are usually made of pine laths ¾ in. wide and ¾ in. wide. Frames to be wired may be made with top bar ¾ in. thick, and the rest ½ in. thick.

Pure Mating of Queens.—I see Mr. Alley, the well-known and successful queen breeder of America, experiences no difficulty in pure mating of his Italian queens, although he may have a hundred black stocks in his apiary. Before allowing his young queens to fly he puts one of his drone traps on to each hive whose drones he wishes to keep indoors, and keeps them on till the queens commence to lay. He says he succeeds in nineteen cases out of twenty, and can also get rid of all useless drones by taking them out of the traps and killing them.

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PROCEEDINGS OF BEEKEEPERS' SOCIETIES.

Victorian Beekeepers' Club.

ORDINARY meeting held at the Manufacturers' Association Rooms, The Exchange, on 2nd November, Mr. Ellery in the chair; the following new members were elected:—Singleton, Mr. H. F., Malvern; Mackleberg, Mr. Jno., Sackville-street, Kew; Wilkinson, Mr. Jno., Kew; Sumner, Mr. Z., High-street, Prahran.

Further discussion took place on the standard size of frame to be recommended by the club, and finally out of twenty-four members present thirteen voted for the Langstroth, and two for the British Standard.

Mr. Ellery read a short paper on some experiments as to the temperature inside hives painted different colours, which showed that in rough unpainted boxes that had got grey with the weather, the temperature sometimes reached 10 degrees higher than shade temperature. In red boxes (Dutch gin cases) the thermometer reached from 12 to 15 degrees higher, while in hives painted pure white the readings were seldom more than from 1 to 3 degrees higher than shade temperature.

Mr. Sumner exhibited Langstroth frames with a longitudinal division bar to support comb in hot weather, also a form of Alley's drone trap and swarm preventer.

Meeting held at Manufacturers' Association Rooms on 15th November. A letter was read from Mr. R. K. Murray, advocating the use of stone hives, and offered to make one, if any member would undertake to place a stock in it and report upon it at a future meeting. The Rev. J. Kennedy undertook to carry out the experiment.

A discussion took place on the question of ants as enemies to the hive and bees.

A member from Heidelberg stated that ants did rob bees, but he prevented it by allowing grass to grow around his hives, and ants would not travel in grass, and it kept them away. Mr. Clark, of Dandenong, stated that during his ten years' experience in beekeeping he never found ants rob except in very weak hives.

Mr. Ellery advised those who found ants troublesome to search for their nests and destroy them with bi-sulphide of carbon.

The question of the best mat to place over frames was then raised, and two or three kinds of lath mats as described in Root's ABC, were exhibited. The secretary said he always used canvas bagging such as used for bran bags cut to size, and hemmed at the edges, and found them all that could be desired. Bees did not gnaw it as they did ealico or lighter stuff, and when this kind of mat was put on it was so light that bees that happened to be on the frames could easily crawl from under it to the spaces.

Ordinary meeting held 30th November, 1885, at the Manufacturers' Association Rooms, The Exchange. Present—Mr. Ellery, in the chair, and about twenty-four members.

Mr. Sumner exhibited frames and appliances for transferring, a sample of Melbourne made drone—excluding zinc, and a form of Clarke's smoker. Mr. Grant stated he had some hives affected with foul brood, and that he was trying Cheshire's remedy, viz., feeding with phenol and syrup. Some members who had never seen foul brood asked him to shew an affected frame next meeting; this he promised to do.

Mr. George Foord read the following paper on "Phenol:"

PHENOL.

GALVANISM took its name from its discoverer, the Italian philosopher, Galvani. It has been remarked that if the name of the discoverer had been Barber, the science thus named after him would have been called Barberism. Mineralogy teems with hundreds of names of mineral species after more or less illustrious or titled men, these names showing nothing of either composition, characters, or relation. Biotite, Scheelite, Brookite, Davyite, Berzelyite, Haidingerite are examples. So, too, of Botany, while Chemistry—exempt from this vagary, and endeavouring to name the so-called chemical elements and their multiform combinations so as to signify, in each instance, some characteristic and distinguishing property of the former, or to give the composition and interrelation of the latter, falls into confusion and many needless complications. Owing to the progressive character of theoretical chemistry, the new chemistry of to-day overlaying the old of yesterday, the same chemical compound bears often six or more names, each of which was accordant with the state of chemical knowledge when it was first given, but which has had to be partially suppressed in conforming to newer views, especially to those of chemical relationship, or the modes of chemical change. This is to be regretted, as its tendency is to keep an intelligent public mystified and very much in the dark concerning the common sense meaning of chemical writings. Some of our readers may very naturally ask, "What is Phenol? Where is it to be obtained? And how is it to be used by the beekeeper?" To these questions we shall now endeavour to give a satisfactory answer. Phenol is hydrate of phenyl; it is phenylic alcohol, it is phenic acid, it is coal tar creasote, and it is carbolic acid. By all these names it is known, but by the latter more familiarly recognised by the public at large. The beekeeper can buy carbolic acid of the druggist as a beautiful colourless crystalline acid, or as a more or less brown coloured somewhat oily fluid, the difference of state resulting from difference in the degree of purity of these several forms. We advise him to commence with the purest form, asking for Crace Calvert's best quality of crystallised carbolic acid—a little of it will go a long way, and after he has ascertained from personal experience concerning the points of efficacy and expense, he may then, if he pleases, try the cheaper qualities, but he will do well to remember that when a weak, watery solution of carbolic acid is administered to bees in their saccharine food, the questions of purity of taste and odour are most probably of greater

importance than that of cost, and that in the lower qualities of carbolic acid, admixture of tarry and more or less fetid impurities imparts to them this lower quality, and warrants their sale at the lower price. Carbolic acid in its purest form exists as a beautiful mass of delicate, snow-white crystalline needles, radiating, interlacing, and thus forming a solid network. Very little water added to the carbolic acid when in this form rapidly reduces it to the fluid state, but without this addition the acid may be easily fused and poured out of the containing bottle by gently and gradually heating the latter by standing it up to the shoulder in a vessel of warm water. The precaution of gradual heating is to avoid cracking the glass phial in which the solid acid is purchased.

To make the weak aqueous solution it is only necessary to shake a small portion of the liquid acid with a comparatively large bulk of rain water in a clear glass stoppered or well-corked bottle, as long as the water continues to dissolve the acid: that is to say, as long as the added oily drops of acid disappear on agitation. We shall not attempt giving directions for weighing the acid and water to be thus brought into combination, preferring to state that the crystalline acid rendered fluid by addition of a *very* small proportion of water, will be found to be a little heavier than water itself, having a density of 1.06 to that of water as 1.00 (say it is six per cent. heavier than its own bulk of water;) it would not, therefore, be a wide departure to regard the acid in this liquid form as very nearly of the same density as water, measuring it in this state in a druggist's minim measure, and the water in which it is to be dissolved also in a druggist's measure of larger size, say of 20 or 40 fluid ounces capacity. A few additional sentences will explain those properties of carbolic acid not yet mentioned, and which are of more or less significance to the beekeeper. Carbolic acid is sparingly soluble in water, but dissolves in all proportions in alcohol, ether, and strong acetic acid. It is powerfully antiseptic, coagulating albumen; fish, leeches, and, indeed, aquatic life generally, die in its aqueous solution. It preserves animal substances, converting them into "mummy;" but, as with the Egyptian mummy, the preservation is not for *all* time. The carbolic acid eventually disappears from the animal tissues by conversion or evaporation, and then comes a stage when acari (mites) attack the dried-up tissues, which consequently crumble to a mass of living dust. A caution may be finally added—The odour of carbolic acid may be compared to that of wood smoke or wood tar; its taste is sweetish and biting, but the strong acid is not devoid of corrosive

properties, as it blisters the tongue or skin with which it is brought in contact, and it is therefore to be handled with caution. Beekeepers who might feel timid on this account should find no difficulty in getting solutions of any definite strength prepared for them by those who have the necessary instruments, and are familiar with the material.

Several forms of hives were exhibited.

The following were elected new members of the Club:—Mr. Whitfield Raw, "Southern Cross," Warrnambool; Mr. N. D. O. Willis, Kooloomut, Nareen; Mr. H. Pennington, Glenira-road, Caulfield; Mr. Jno. Martin, Cotham-road, Kew; Mr. Jos. Ingamels, Malop-street, Geelong.

Ordinary meeting held at Manufacturers' Association Rooms, the Exchange, 14th December, 1885. Present—Eighteen members; Mr. Ellery in the chair. Mr. Grant, according to promise, exhibited a frame from a hive badly affected with foul brood, for the information of members not familiar with its appearance. He had moved all his affected bees into new hives with full foundation, fed on phenol syrup, one part in 500 by weight—new brood that shewed any signs of the malady returning he immediately sprayed them with thin phenol syrup, and so far he reported the treatment apparently successful. A conversation ensued on bee forage and plants and trees much frequented by bees this season, and members were requested to report their observations in this direction to the editors of the Journal.

The following new members were elected:—Mr. James J. Whitham, Dandenong; Mr. Baldwin, Clarendon-street, East Melbourne; Mr. P. Hotton, Heatherton.

South Australian Beekeepers' Association.

THE monthly meeting of this society was held at the Chamber of Manufactures on Thursday, 3rd December; Mr. J. H. Wiedenhofer in the chair, and there was a large attendance of members. The Hon. Secretary mentioned that he had made arrangements with the Royal Agricultural Society to have a show of beekeepers' products and appliances at the Autumn Show of the Society, and that a liberal prize-list had been published by them. In answer to an inquiry, it was stated that any member of either Society might compete upon paying the usual entrance-fee for his exhibits. Mr. Fiebig sent in a Ligurian bee from Kangaroo Island, the first result of his own bee industry at that place. Mr. Stevens brought in several queen cells built upon drone comb, and from one of which a queen had emerged. Mr. Fiebig reported that there

were about a dozen colonies of black bees existing upon Kangaroo Island at the back of Hog Bay. Several lots of "shiny" bees were shown, and it was reported that nearly all beekeepers were losing large numbers through the same cause. Mr. Coleman said he had a colony that was badly affected with the "shiny" disease. Bees become quite smooth, and black and shiny. On removing the queen and substituting another queen, the sickness disappeared, and the bees recovered their strength. It was stated that Dzierzon called this disease the vertigo, and he attributed it to the bees eating poisonous honey. Some of the members stated that the disease disappeared if the colonies were well fed. Mr. J. H. Wiedenhofer showed heads of Black Russian and Californian double-flowered sunflower, and he strongly recommended the flower to beekeepers as a fertile source of pollen and honey.

A paper by Mr. E. A. Coleman, of Mount Barker, was read at this meeting, which is an important and valuable contribution from an experienced apiarist, keeping at least 200 stocks. This paper will be given in full in our next number.

ORIGINAL CONTRIBUTIONS.

Beekeeping.

BY W. ABRAM, MANAGER OF THE ITALIAN BEE COMPANY, PARRAMATTA, N.S.W.

(Continued)

PART II.—THE HIVE.

THE old kinds of hives and bee boxes, I am glad to say, are rapidly falling into disuse since the introduction of the Bar or Frame Hives, and a new and better era has dawned for both bees and beekeepers, as instead of the inhuman method of destroying those busy but ill-used creatures, by suffocation at the end of their harvest season and robbing them of the fruit of their labours, or even the less cruel fashion of driving them in the autumn from their well-stored dwelling into an empty one and leaving them to face starvation as best they could through the cold days of winter, or the chance of their surviving somehow till spring came again. The surplus of their accumulated stores can now be taken from time to time as available with scarcely the loss of a single bee and little trouble or danger to the owner of the apiary.

Of the many new inventions in this direction, I shall confine my remarks for the present to a description of the hive which after long experience I consider the best and most suitable from every point of view. I allude to the Berlepsch Hive, and I may primarily state that the original idea of movable combs in a beehive, emanated from Dr. Dzierzon in

Germany, who in the year 1845 first brought it into notice. He made his hives with bars one inch wide placed half an inch apart, on which the bees had to build their combs; these combs when loosened from the sides and bottom of the hive hung on the bars only and could easily be removed therewith; but this invention was soon found to be capable of further improvement, and Baron von Berlepsch succeeded in constructing a frame which enclosed the comb all round, instead of the bar at the top only. This was a decided and most important advance in the right direction, but the question yet remained as to what was the proper size for the hive and frames. The Baron and another German (Dathe's) never tired investigating and experimenting in that direction till they completed the hive which is now almost universally used in Germany, Austria and Russia, in fact nearly throughout all Europe, and which in my opinion combines not only all the requirements for the easy treatment of the bees, but is most suitable to their nature and habits, as I shall endeavour to show in another article. In America about the same time, or a little later, Mr. Langstroth invented the Hive now generally used there, and which very much resembled the Berlepsch Hive, which at first was opened at the top, and the combs were taken out in the same manner as is now done in the Langstroth Hive, and in England various kinds of frame hives have been introduced from time to time, amongst which the Woodbury-cottage Hive is perhaps the best. But both the Langstroth and Woodbury Hives have many objectionable features, which defects have been remedied in the Berlepsch Hive, and I notice that any alterations that have been of late made in the various kinds of hives approach more the Berlepsch than either the Langstroth or Woodbury principle. There is no doubt that the size of the hive, as is admitted on all sides, is one of the most important points no matter what principle may be adopted, and has a very considerable effect in producing a successful result or otherwise; it is also necessary for the economical and convenient working of an apiary that there should be one standard for both hives and frames, which should all be made to one exact pattern, so that they can be used indiscriminately as occasion may require; in fact, it would be advisable that this principle should be carried out in a whole district if possible; but, of course, this might not in all cases be practicable, as every beekeeper has his own fancy in this as in other matters. However, whatever kind is adopted, I should advise the beginner to get at least one sample hive from an expert, and then he can make all

his hives to this model. The different kinds of the American and other hives have already been so frequently described in the journals of the day, that they are therefore, I presume, pretty well understood by those interested in such matters, but as an account of the hive used by me has not hitherto been published so far as I am aware in the Australian Press, it is my intention to give a detailed description of it, and the exact measurements of the structure throughout. I shall also explain the various points wherein it differs from other frame hives, giving at the same time my reasons for preferring it to any of the others. First, the hive itself is made of well-seasoned $\frac{3}{4}$ inch boards, dovetailed and firmly nailed; inside measurement $23\frac{1}{4}$ inches in height, $9\frac{1}{4}$ inches wide, and 16 inches deep from back to front. It is divided into two compartments, the lower or brood room being 15 inches, and the upper or honey room $7\frac{3}{4}$ inches in height, with a half inch partition between the two; a small opening about 3 inches long by 3-16 wide in the front of the partition board admits the bees from the lower to the upper storey, which can be closed or left open as desired, a small slip of wood being made for this purpose to fit over it. And in addition to this means of communication, a portion of the partition in the middle about 3 inches wide is made movable, so that when honey is very plentiful this piece can be taken out also, in order to give easier access from below. A groove $\frac{1}{4}$ inch in depth and width is made in the side walls of the honey room from back to front exactly a $\frac{1}{4}$ of an inch below the top board for the honey frames to hang on, and a second similar groove is made in the brood room at the same distance below the partition board for the brood frames, while $7\frac{5}{8}$ inches lower is made a third groove the same size as the other two, so that small or honey frames can be used then as well.

The honey room contains 10 small frames, and the brood room 10 large or 20 of the small ones, which are just half the size, and each room has a glass door to fit in at the back of the frames. The entrance for the bees in front, which should be $4\frac{1}{2}$ inches wide by $\frac{1}{2}$ inch in height, is made about an inch from the bottom, and can be closed or opened by a small zinc slide fixed on the outside; underneath the entrance is a board 8 inches wide, and projecting about $2\frac{1}{2}$ inches, for the bees to alight on when returning honey-laden or wearied after a long flight. The door is at the back, and is the whole size of that part of the hive, so that when it is removed or opened the interior of both compartments can be seen without disturbing the occupants. In the door is a movable slide or jalousie, which is

closed on the inside with wire cloth, and thus enables ventilation to be given either in very hot weather or when the hive is closed up for removal or on a transport journey. The frames are of two sizes, as already mentioned, the larger being especially for brood, and the smaller for honey; both are made from sawn soft wood 1 inch wide by $\frac{1}{4}$ thick, the top pieces being $9\frac{3}{4}$ inches and the bottom $9\frac{1}{4}$ inches long, and rounded a little at the ends; but the sides of the brood frames are $13\frac{3}{4}$ inches, while those of the honey frames are only $6\frac{5}{8}$ inches long. All the pieces are cut to a pattern the correct length, and are then nailed together at top and bottom on a block of corresponding size, the top pieces extending $\frac{1}{2}$ inch beyond the sides to run in the groove in order to secure exactness; then in the top and bottom pieces, at the right hand corners at each side, a nail is driven, but standing out $\frac{3}{8}$ of an inch, which keeps the frames at the proper distance from one another in the hive. When putting in the frames, push them in as far as these nails will permit and then put in the glass door; this will keep all the frames firm, and prevents any friction of the combs, even in transporting them from one place to another. When the frames are fixed there is about $\frac{1}{4}$ inch space between them and the sides of the hive, and underneath about $\frac{1}{2}$ an inch to allow the bees to pass to and fro, but too small to admit of cells being built to block up the passage.

(To be continued.)

HINTS ON BEEKEEPING.

By H. Naveau.

AMONG the various events in bee life there never was one which afforded me more pleasure than swarming. Often times I have enjoyed myself watching the process. But at times one has to experience pain mixed with pleasure, which may occasionally become serious, yet it never lasts long. It never before, however, entered into my mind that far greater pleasure than at swarming time could be realised by queen rearing. A few days after the little incident occurred which I mentioned in the first number of the journal, I went into queen rearing in right earnest, and it so happened that on December the second issued a very small swarm. I hived the swarm at once, then went to the hive from which it had come, and found that all the queen cells were mature; I lifted out the frame which contained those cells, and which I had supplied with eggs on Alley's principle, and took it near to the window in my workshop facing the Apiary, and in five minutes' time witnessed not less than six young queens leaving their cells, so that during fifteen minutes I had twelve virgin queens from an imported Italian

mother safely caged on the comb and returned to the hive in which they were hatched. I was highly pleased with my success, and indeed it is an interesting scene to notice how the young queens employ their mandibles endeavouring to remove the lid from the royal cradle. For a few minutes I was a little perplexed what to do with all these young queens, and how to ensure fertilisation with pure drones. I made nuclei and gave them each a young queen, and some I introduced to full colonies. From one hive, a few days after I had introduced a queen, a swarm issued; I hived the swarm, searched the old hive, and found that it had queen cells which I had not previously observed. I pinched out these cells and introduced another queen, but a few days after, when coming in close proximity to this hive, I noticed a strange sound, just as if two queens were in the hive, the one at liberty and the other yet in the cell. I opened the lid of the hive, searched every frame, and found no cell until I came to the very last one; there I discovered just on the edge of a piece of transferred comb, a very large queen cell, quite mature. The sound which the young queen produced was so shrill that I could hear it many yards away in the garden. As soon as I got the cell out of the hive she crawled into my hand and I procured a nucleus for her. She is the largest virgin queen I ever saw. With one of those queens I tried fertilisation in confinement, but with this I was not successful. Some of the nuclei I removed at once to a locality where there were no bees but those which I put there myself, and I have therefore sufficient reason to believe that some of them will be purely mated.

In the beginning of the season there was so little honey coming in that I said in a letter to a friend at Brisbane "I shall be satisfied if my bees get this season as much honey as they need through the winter." But recently, when the hot weather set in, the honey began to flow at once, in such a way that I cannot get eggs for queen rearing; the bees will not allow the queens to deposit their eggs in those cells where the workers mean to store honey. When I first supposed the season to be a poor one I set the bees to work to draw out plenty of foundation, and now I reap the benefit of this stratagem. I find the usefulness of the extractor, and also the exceedingly profitable method I have adopted in my frames, namely, an upright bar in the centre of the frame. I meet with some frames, which have one half fitted with brood, the other half with pure honey; I put them through the extracting process without breaking a single comb, and the frames are not wired.

On one of my hives which did not swarm I fixed glass globes for the bees to fill with

virgin honey, and in one of these I put a tube made of foundation. As I noticed this to disappear very soon, I put in some more narrow strips of foundation, which also were devoured very soon, and used for the same purpose as the bricklayer would use mortar. Not satisfied with this discovery I got next a larger quantity of strips of very old foundation, but nearly white, and I threw them in different directions among those globes, and I watched the bees and saw them make use of it, indeed I could notice that they were quite delighted to get material already prepared for them. On December the 8th I put five globes on that hive, and now on the 18th they are nearly full of pure white comb honey. I cannot exactly state what quantity of honey I shall be able to take from each hive, because I am troubled too much with swarming. It is of no use whatever to give them ample room to store honey; I may put on sections, but they will swarm, and then the sections are left empty. Well, I deceive them, I put the swarm on the place of the hive, and give it the sections from the latter also, and they go to work in right earnest. There is just another remark I would like to make in reply to Mr. "Drone Comb," where he stated he never read anything in American Bee Books about the metal runners, but I did. I am very well certain that Mr. A. T. Root, of Medina, Ohio, claims the ownership of that invention. I intended also to reply to some of the queries, but I must leave this for others to do or otherwise my paper will become too lengthy.

MANAGEMENT OF BEES IN BOXES.

By R. L. J. Ellery.

NOTWITHSTANDING the much greater advantages afforded by frame over the ordinary box hives there will always be a very large proportion, especially of the common Black or Brown Bee kept in various kinds of boxes or packing cases, such as Dutch gin cases, candle boxes, kerosene cases and such like, because they can generally be obtained at a very small cost in any part of the country. With a notch cut in one edge for the entrance, and almost "anything" for a bottom board, the hive is complete. Many beekeepers with from 50 to 100 or more stocks use nothing but such hives, and in good seasons secure excellent returns in honey and wax if all goes well. It is not an uncommon thing to see boxes of every conceivable kind placed in rows and piled one over the other in the shelter afforded by a fence or hedge forming an apiary of scores of hives, the only protection against rain or sun being pieces of tin or galvanized iron, some old sacks, pieces of bark

or split palings laid on the top tiers. Bees seem to thrive well in these boxes and store rapidly in good localities and seasons.

A casual visit to some such apiaries when bees are busy and all going well almost convinces one that the *old box system is as good as any*. But it not unfrequently happens that some beekeeper has lost all his bees. Something has gone wrong—stock after stock have left, others had dwindled and died, till out of 50, 60 or 100 stocks scarcely one remains strong. Every year we hear of such things. It is accounted for by a bad season in the locality and starvation, or the moth has got into the hives; but there is no certainty as to the cause of the loss, owing first to the lack of acquaintance with the diseases of bees and cause of such loss in the apiary, and secondly to the difficulty of examining the combs and the brood until it is too late and all the bees have left. If the bees had been in frame hives it would have been easy directly any dwindling and want of activity was apparent among them to have examined the combs and probably have stopped the spread of disease and trouble among them before it had extended to any large number of stocks. But as box hives will be used by those to whom the profit of beekeeping is most important, until they are no cheaper than frame hives, a few hints concerning the signs of disease, cause of weakness and inactivity, the best way of manipulating and examining bees in such hives may, perhaps, assist some beekeepers to a better management of their stocks and possibly avoidance of much loss.

An experienced beekeeper can always judge by watching his bees going in and out of the hive on a fine warm day, whether they are working well, and if brood is being reared; for it must be remembered that as bees only live five or six weeks in the honey season, a stock must rapidly dwindle if from any cause no brood is being reared. If on any fine warm morning bees are seen busily going into the hive without loitering—many of them laden with little pellets of pollen on their legs at the rate of thirty or upwards per minute, according to the strength of the hive, it may be presumed all is going well; the amount of bustle and activity giving one a very good idea of the state of the household. Such hives may be left alone so long as they are moderately well sheltered from the direct rays of the sun (especially if the box be of any dark or dingy colour) and protected from rain. If, however, a stock is found to be very inactive, or going in and out listlessly in small numbers—few or none carrying pollen, or busy bringing out dead bees, or hanging lazily about the entrance, while a peculiar faint sickening odour is apparent close to the

hive, something wrong may be expected, and a careful examination should as far as possible be at once made.

To be able to examine the contents of a hive it is necessary to control the bees a little, or a battle may ensue. If bees are frightened they will at once fill themselves with honey, if they have any, after which they are as a rule very peaceable, and will allow of a good deal of handling if they are not crushed, squeezed, jarred or otherwise violently treated. To get bees to fill themselves, either drumming the outside of the hive or smoking them will do, but for the purpose of examination smoke is certainly the best. Tobacco may be used sparingly, but as it intoxicates bees very quickly and sometimes makes them angry also, smoke from rags, or rotten wood is preferred. There are convenient "smokers" with bellows which are generally used for smoking bees, which cost from 3s. 6d. to 6s. each, and with these nothing is easier than to "smoke" a hive as much or as little as is required. To those who do not possess a smoker the following is advised:—Roll up some old cotton rags or a piece of old sacking (or any old cotton or hemp stuff that is quite dry,) not too tightly into a sausage-shaped roll, by well lighting one end and letting it flame a little, a portion becomes charred which will smoulder a long time if the flame is put out. When smoking a hive blow a stream of smoke from the smouldering roll into the entrance until a loud hum from the inside is heard. Wait a few seconds and then tilt up the hive and blow a good cloud all over the bees and combs. This so alarms the bees that they gorge themselves with honey, and the hive can now be turned up without the bees flying, except here and there a straggler, and the combs examined as far as is possible in a box hive. Combs can be cut out for honey or for examination, or the bees can be drummed into another hive, or if the combs are not too heavy with brood and honey the bees can be shaken out by a few downward jerks into another box, or better, on to a sheet on which another box is placed with its front propped up to enable the frightened bees to enter.

We will suppose the beekeeper has noticed one or more of his stocks getting weaker and weaker and the bees about showing but little activity, and he is desirous of examining as to the cause. He will first smoke his bees as directed, and then turn up the hive, keeping his smouldering roll of rags ready for a few more puffs of smoke if the bees get too bold, when they will soon give in and be quiet. He first looks at the character of the combs to see if they look clean and dry, and takes particular notice if there is any faint sickly smell issuing

from the combs, and whether there is or not he should cut out a piece of comb from near the heart of the hive that has sealed brood in it. Now he should carefully examine this brood comb.

First, to see if there are eggs in any of the cells. (The eggs are very small white dots and require a good light to see them at the bottom of the cells.) Also to ascertain if there are grubs of all ages from the egg up to the grub sealed over.

Second, to see if all the covers of the sealed brood appear rounded so as to stand a little above the general level of the comb, and especially to see if any of these covers appear sunken instead of being raised—if any such sunken covers are seen, open it with a pointed piece of wood and see if it is simply a dead bee or if the cell contains a brown coloured sticky fluid which has a nasty smell of decayed animal matter, if it does, there can be little doubt the hive is affected by that worst of bee diseases "*foul brood*" in which case the sickly odour of the hive would most probably already have attracted the attention of the beekeeper. This disease, if not stopped at once, will soon extend to every stock and all the bees die off or leave, and is the cause of the destruction of many an apiary in Australia as well as in other countries. What had best be done in such a case will be presently stated.

Third, he should look if there are any signs of moth grubs burrowing through the combs, if there are they can generally be seen by the silky webs which cover their tracks through from one cell to another.

Fourth, he should look generally as to the condition of the bees and comb.

If he has noticed numerous bees on the ground in front of the hive, many dead and others dying, lying on their backs, trembling violently, their bodies swollen larger than usual, and perhaps spots of excrement about the entrance, he may be certain his bees are affected with a disease which is now getting common in apiaries, and concerning the cause of which or the best mode of treatment very little is as yet known. It is called by some American beekeepers the *unnamed disease*.

Now, let us consider what is to be learned from the results of the examination of some hives.

We will suppose the first one had been observed to get less active for some weeks past after a second swarm; very few bees are seen to be carrying pollen, and although the hive is heavy from honey, the bees appear to be getting less and less. On examining the combs they were found to be very thinly covered with bees; the hive had the natural smell, and no foul odour perceptible. A piece of the central comb cut out was found to be full

of honey, but no brood either in the shape of eggs, grubs, or sealed bees to be found, except here and there a cell was covered, but found to contain a dead and dried up bee.

This hive is Queenless, and probably the young Queen hatched after the last swarm left, was lost on her marriage trip, and the bees had no eggs or young larvæ from which to raise another. To set this colony right a new Queen should be introduced* or else the bees should be united with another stock which has a Queen, and is thriving. In the latter case the honey can be taken at once, but if a new Queen is given the combs must not be disturbed.

In the second hive examined, the bees had dwindled considerably, a few only appeared to be working half-heartedly, while many were seen idling about the mouth of the hive, or constantly fanning at the entrance with their heads towards the hive. An unwholesome sickly odour was noticed immediately the hive was tilted, but the combs were fairly covered with bees which did not appear so lively as usual. The piece of comb cut from the heart of the stock emitted a peculiar and most offensive smell. Many of the caps of the sealed brood cells were noticed to be sunk down, and presented a flat or even hollow instead of a convex surface. Some of these sunk cap-pings had small holes in them, and when a few of them were opened out they were found about $\frac{1}{3}$ full of a brown sticky stuff like dirty glue, which adhered to the pointed stick, and drew out in threads, and gave out the peculiar stench already noticed. If it were not for this nothing wrong with the bees could be observed except their want of life and activity.

This was a case of the disease known as *foul brood*, which is unusually contagious among bees, and soon spreads among other hives, and often deals sad havoc and even total destruction to the whole apiary. The cause of this disease has lately been traced to a minute germ which attacks both the Queen and the bees, but apparently does them no harm, but it also attacks the young brood and they die in the cell at any time from the egg to the bee nearly ready to hatch. The germs feed on the dead substance, leaving only the putrid viscid mass behind, which is so foul and offensive that the bees refuse to remove it, as they do nearly all other decayed matter, and the hive not only becomes almost unbearable to the bees, but none or very little brood is hatched, the stock diminishes by the old bees dying, and unless the remainder desert with the Queen, they may be found eventually reduced to a quarter of a pint of

bees and a diseased Queen. The beekeeper having made the unpleasant discovery that he has foul brood among his stocks, naturally asks, What is best to be done? The fact that his bees are in boxes and not in frame-hives limits the means he can adopt for effecting a cure to one very simple process, namely, driving his bees and Queen into a clean hive, and let them build new comb and begin again. It will be better to feed the bees freely with white sugar syrup into which is put a little "phenol" (or pure white carbolic acid crystal,) say about ten grains to each pint of syrup. The bees will take this unless there is a free flow of honey, but if they do not, it will be well to thin the medicated syrup with a little water, invert the hive and pour a little over the comb and bees every five days or so till young bees make their appearance, after which in all probability no foul brood will again appear. A further examination of the new comb in five or six weeks after the hive was changed will be desirable to make sure it is cured.

The old box, and all its contents, can now be burned; but if proper precautions be taken that no bees can get at the honey and combs, the honey in the comb can be cut clean away from the diseased brood, and if there is no objection to a rather sickening job, the foul broody comb can be plunged into a pot of boiling water and boiled until all the wax separates and floats on the top, when all may be left to cool, the wax taken off, and the water thrown on a manure heap. The honey should be drained or strained from the comb and placed in a bottle or small *tin billy*, which is put in water in a larger vessel. The water is brought to a boil for ten minutes and the honey skimmed and put away for winter feeding.

(To be continued.)

CORRESPONDENCE.

(To the Editors of the *Australian Beekeepers' Journal*.)

GENTLEMEN,—The appearance of your journal should be hailed with satisfaction by every beekeeper in Victoria. It is creditable alike to the editorial and publishing department, and I hope it will have a long and useful career. The beekeeping industry has been sadly neglected hitherto in this grand country of ours, and I trust the *Australian Beekeepers' Journal* may be the means of arousing an interest in an industry that is not only very interesting as a study, but may be made interesting in a pecuniary way by the use of proper appliances. As my time is somewhat limited, I will not be able to say much about matters apianian in this district this month,

*Instructions for giving a new Queen to a stock will be given in our next number.

but I may perhaps be able next month to send you a few scraps.

In the first place, then, I may as well say that Daylesford is not by any means the best place in Victoria for beekeeping. Being situated some four or five miles north of the summit of the coast range, and at a level of about 2000 feet above the sea, it is subject to cold, squally winds from the southward, which sweep over the range, and have a chilling effect on the bees, and prevents them from leaving the hive in search of food, and my experience this season tells me that it has prevented swarming to a very considerable extent, as I know of a good many beekeepers in a small way who have not had a single swarm this season. Of course the people I speak of adhere to the old style of gin case, candle box, or even sometimes a kerosene case. The case is somewhat different with those who are using the Langstroth Hive, which was first introduced into this district by Mr. T. J. Loukes, who obtained them from Bagnall Bros., New Zealand, some fifteen months ago. Mr. Loukes may be called our leading apiarist. He has some forty or fifty hives, of which about twenty are Langstroth, made after the pattern obtained from New Zealand. He has had frame hives for several years which he made from a description in some work on bees he had obtained from America. The frames were 12 inches square. He is now discarding those, and intends using nothing but the Langstroth. He informs me that so far as the season has gone there is a good deal of honey coming in, which is also my own experience.

With regard to the diseases among bees in this locality, foul brood is the principal. Some twelve years ago it carried off nearly all the bees in the district, whether in hives or in the forest in a wild state. However, I have only seen one hive affected with it this season, although I have heard of several hives being badly affected at Dry Diggings, about five miles from Daylesford.

There are several outlying places such as Hepburn, Franklinton, Yandoit, &c., where I am informed that bees are kept somewhat extensively, but as I have not had an opportunity of obtaining any information from these localities lately, I will reserve any remarks till a future time.

Wishing the *Australian Beekeepers' Journal* every success,—I am, &c., J. M. H.

Daylesford, 23rd December, 1885.

(To the Editor of the *Bee Journal*.)

DEAR SIR,—A good friend kindly sent me the first number of your *Bee Journal*. I wish it every success and trust that it will be the means of promoting the pleasant, fascinating

and profitable hobby of beekeeping. I have been a beekeeper in a small way for some years past, and on the whole have been tolerably successful, for I am a busy man and have not the time to look after them as they should be attended to. The first year was one of experiment. Like all other enthusiasts, I read with greediness all the bee literature upon which I could lay hands, and did not in the multitude of counsel find wisdom, but rather confusion. I made hives of various kinds, and tried many recommended courses of action. At length, by successes and more failures and dear-bought experience, I gained a certain amount of wisdom, and consequently conducted my bee operations more easily, satisfactorily and profitably.

I decided upon a form of hive, size of frames, section boxes, &c. To this I have ever since adhered most religiously, and it would take the combined strength of many Bee Associations to persuade me to alter any part by a single inch, I am so thoroughly convinced of their simplicity, ease of construction, and suitability to the locality and surroundings. Standard Hives and Standard Frames are good subjects for discussion at meetings of Bee Clubs; but you will never get the whole company of beekeepers convinced that one particular hive is better than all others—we all have our special likings, and lean towards that style of construction which we have found best adapted to our own locality, and with which we have been most successful. There is, however, one principle of fundamental importance, an axiom of unusual application in beekeeping—that is—that everything, hives, frames, covers, floor boards, &c., &c., should be made to pattern. Everything should be interchangeable, whether the apiary be large or small. Having after mature consideration decided upon size and form of hive, I at once cut up and demolished a previous very varied construction, and now all goes on like clockwork. If I have a weak hive, I can take a frame of brood or a frame of honey from a populous hive and strengthen the weak. I can transfer a whole colony from one hive to another clean hive, taking away any old or diseased comb in a quarter of an hour, or I can divide a strong colony into two to prevent swarming, or I can place one hive over another with a zinc queen separator between, thus getting combs of pure honey for the extractor. There are so many advantages in having everything in an apiary interchangeable that I can't stop to enumerate.

One object of your *Bee Journal* should be to provide bee culture, amongst farmers, gardeners, cottagers and others, by showing them that bees can be profitably managed in

the modern plan, with appliances which may be constructed by any one who is able to use a saw, plane and chisel, that there is no reason to purchase expensive hives, &c. The hand of a carpenter never did work on any of my hives—they are amateur constructions of good inch deal boards, as easily made as knocking together a packing case, yet as to measurement, all alike, for it would not do to depend upon the inch rule. You know that Sir John Herschell purchased I don't know how many from the best makers, and no two agreed. I have permanent gauges for every part, by them all is cut out, putting together is a very simple matter. These rambling remarks are intended to aid the good work. If you think worthy of space please insert, if not, consign to that receptacle of worthlessness—the waste paper basket.

W. J. T.

Geelong, 19th December, 1885.

NOTE.—Some Correspondence unavoidably held over till next number.

NEW BOOKS, REVIEWS, AND EXTRACTS FROM FOREIGN JOURNALS.

FOUL BROOD, ITS MANAGEMENT AND CURE.
By D. A. Jones, Beeton, Ontario, Canada.

THIS is a little pamphlet by a well-known beekeeper in Canada of very large experience. He treats of chilled brood, neglected brood, overheated brood, drowned brood, dead larvae, and foul brood. After a long experience of the latter he advises a certain method of treatment. He causes the bees to fill themselves with honey, and then he shakes them from the combs into a swarming box or hive covered with wire net. He places this hive in a dark cool place (cellar if possible) for a period of from four to six days till they show signs of starvation, which is known by some falling down and crawling about in a slow, quiet manner. The bees are then shaken out in front of a hive with combs and food. The combs of the infected hive he melts down into wax, and boils the frames to kill all germs. He extracts the honey and boils it, and then feeds it back to the bees. Mr. Jones's conclusions on many points are at variance with the more recent views upon this matter which have found acceptance among apiarists, still this little book is a really valuable little pamphlet, which should be read by all beekeepers. In his concluding remarks he says, "Destroying colonies affected by foul brood, by fire, or otherwise, we consider a wanton destruction of property."

FLOWERS FOR BEES.—The beekeeper that requires to grow flowers for a harvest must grow them by the acre, and he should go in for fruit and vegetables, then he would have a double chance, for, if honey fail, then he might get fruit or vegetables. Or if he is in the farm line he could go in for clover, which would give him three chances, namely, honey, seed, and hay, which would pay him well if he got a good crop of either; and better still, if he gets white clover for black bees and red for Ligurians. At the same time all beekeepers should grow a good batch of honey and pollen-producing plants as well, no matter if you have no more than one hive of bees. It saves hundreds of bees from perishing in the spring and autumn in going a long distance to look for flowers, and in bad weather in summer they will stay close at home if they have flowers that they like. Bee-plants act in spring and autumn as stimulants better than any man can give.—*H. Jeans, British Bee Journal.*

RECIPE FOR MEAD, as it was made a hundred years ago.—Take a gallon of honey, and add to it eight gallons of water, boil it down to six gallons. Then pour it into a large vessel, earthenware preferred, let stand till almost cold, then add a little yeast to set it fermenting. When it has fermented a day or two put it into a clean spirit or wine cask, and stop it close. Let it stand in a cool place two months, then bottle it off and put into each bottle two cloves and a little lemon peel.—*British Bee Journal.*

THE ANTENNÆ OF BEES.—In the August number of the journal of the Linnean Society, Mr. Rovers J. Bryant contributes "Notes on the Antennæ of the Honey Bee." A minute and interesting description of the microscopic appearance of these wonderful organs is given, and he gives his opinion that they are endowed with the sense of *smell* and *touch*. He states that since his paper was read he finds Dr. Paul Schiemenz has described the structure of the antennæ of bees, and refers to them as *touch* and *smell* organs.

QUERIES AND REPLIES.

REPLIES TO QUERIES.

To No. 1.—The latest dates on which swarms may be expected in this part of Australia depends on circumstances. As soon as bees begin to despatch the drones we need not expect any more swarms; and in regard to the latest hour of the day, I have never had any swarms after four p.m. H. NAVEAU.

Swarms have been taken up to the 10th January this year. The latest ones occurring will be given in future numbers. ED.

To No. 2.—I have never been troubled with the bee moth. H. NAVEAU.

To No. 3.—The weed mentioned—ketlock or catlock—is unknown to me; if the botanical name is given I might be able to reply.

H. NAVEAU.

The plant referred to is frequently seen making corn fields yellow as the grain comes into ear, and bees seem very fond of it, for some fields this season covered with its flower were quite noisy with the hum of bees. This weed has different names in different countries, its botanical name is *Sinapis Arvensis* or the *field mustard*, and is a good honey-producing flower in Europe. ED.

To No. 4.—The appearance of the *small shiny bee* among Italian stocks was noted in America in August of this year. It was also observed in South Australia this season, but no satisfactory explanation of the presence of this defective bee has yet been given. In some stocks they are very numerous; but they get rapidly killed off by the fully-developed bees, and heaps of dead ones are seen in the front of some hives. A South Australian beekeeper states that they disappeared last year directly there was a good flow of honey.

These bees are marked like the other Italians, but being quite free of the yellow down (bald in fact) they have an intensely black and shiny appearance, except on the yellow segments. Many of them are very small, not above half the size of a full-sized bee. They are found in strong healthy stocks as well as in weak ones, but are certainly worse in hives scantily supplied with honey than in those with full combs. It is possible they are the result of too rapid breeding. When, either from lack of proper or sufficient nutriment while in the larva condition, or deficient nursing power, a quantity do not attain the normal development before reaching the proper stage—whatever may be the cause, it is seriously affecting all Italian and hybrid stocks just now. We must wait for further development of this subject. ED.

To No. 4.—Every bee on leaving the cell leaves its *shift* (or *cocoon*) behind, on this account the bees hatched in cells which are very old are smaller in size than those out of new combs, and dwarfed or deformed bees are mercilessly thrown out of the hives.

H. NAVEAU.

To No. 5.—This is a hard nut to crack. In my estimation A. J. Root's "A.B.C. on Bee Culture" is without doubt one of the best for a beginner; but the perusal of one book only gives insufficient information. Quinby's "New Beekeeping," by L. C. Root, is another very good book, and so is "Langstroth on the

Honey Bee," but whether any of these are to be obtained in the colony I am unable to state.

H. NAVEAU.

The best books on apiculture generally are as follows. Hunter's "Beekeeping," Cheshire's "Practical Beekeeping," Quinby's "New Beekeeping," Root's "A.B.C. of Apiculture," Dzierzon's "Rational Beekeeping," Cook's "Manual of the Apiary, &c." A new book on beekeeping is about to be published by Mr. Cheshire. These books all vary in price from four up to seven or eight shillings. For a cheap, good, useful little book for beginners or cottagers there are none yet to surpass the handbook issued by the British Beekeepers' Association, called "Modern Beekeeping," a handbook for cottagers; the price is only sixpence. Unfortunately they are not obtainable in Melbourne at present, but a number have been ordered from England. The New Zealand Bee Manual, by J. Hopkins, is also an excellent manual, moderate in price (two shillings), and gives the essence of many of the best bee books, adapted to Australian and New Zealand requirements. ED.

To No. 6.—I do not wonder at all that the querist was a little puzzled, for I can believe in the bees swarming out, but not in their returning again after a week; this must have been a swarm from another hive or another apiary.

H. NAVEAU.

QUERY No. 7.—I noticed in one of my hives that all the combs and the centre portions where brood is generally deposited all partly filled with honey and no eggs, larva or brood of any kind visible. What is the reason? Is it likely the queen is dead or past laying? What should be done?

BEGINNER.

QUERY No. 8.—Will some of our experienced beekeepers tell me the best kind of food to give to bees when they are short of honey, and what is the best form of feeder?

W. A. M.

QUERY No. 9.—On opening one of my hives after the Christmas holidays I find every comb empty of honey. A fortnight before there was plenty on the tops of five or six frames. Is such a state of things usual?

L. S.

QUERY No. 10.—Can you or any of your readers say if the flower of the oleander is poisonous to bees as I have noticed several dead ones remaining in the flowers?

EMILY, Bullarook.

QUERY No. 11.—Is there much honey in sunflowers, and would it pay to plant largely for bee pasturage? Are the seeds and other parts of the plant of any value? Which of the Eucalypti trees give the most honey, and how often and at what time of year do the more common kinds come into blossom?

E. L. C.

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JOURNAL

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J. H. KITCHEN.



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THE

Australian Beekeepers' JOURNAL.

VOL. I.—No. 3.]

FEBRUARY, 1886.

[PRICE 6D.

EDITORIAL NOTICES, &c.

WE are glad to inform our readers that the *Australian Beekeepers' Journal* has so far met with very gratifying success. From all parts of the colonies applications for our first number have been received, and encouraging letters from apiarians as well as favourable press notices assure us that there is scope and need for such a periodical.

For its continued success we must obtain the hearty co-operation of beekeepers and beekeepers' associations by communications, information, experiences and apicultural news generally, and we have to thank those gentlemen who have already assisted in this direction, and without whose help we could scarcely have made a fair start.

Reports from different districts of the prospects of the honey harvest, the condition of apiaries, existence of disease, yield from different plants, are wanted, and we again invite communications from our subscribers and other beekeepers on these subjects.

It is proposed to shortly commence a series of simple directions for beginners in the art of apiculture in order to meet numerous requests from all parts of the colony for information in the A B C of beekeeping.

We would direct the attention of our subscribers and all beekeepers to our column for Queries and Replies, and express the hope that it will be freely and unhesitatingly made use of. In the replies, we ask the aid of experienced beekeepers throughout the colonies.

PROCEEDINGS OF BEEKEEPERS' SOCIETIES.

Victorian Beekeepers' Club.

AN ordinary meeting of this Club was held at the Exchange, Collins-street West, on 11th January. There were about twenty members present, and Mr. Ellery was in the chair.

Mr. C. Clough gave an account of his experience in beekeeping in South Australia, and described a cheap frame hive made from a common kerosene case. He stated that the season generally had been a bad one for bees, and those who kept their stock in ordinary boxes had lost largely from starvation. Constant feeding had been necessary in many localities to keep the bees alive. He attributed this to the early heat and dryness of the season, but expected matters would improve as the Eucalyptus began to blossom.

Mr. Clough promised to give a detailed description of the cheap hive for insertion in the *Journal*.

An interesting conversation on the chief sources of honey and pollen for the present season ensued, and members recounted their observations on trees and flowers visited by bees during December and January. The African box thorn ("*Lycium Horridum*") and prickly box ("*Bursaria Spinosa*") were spoken of as favourite sources, and were visited by bees in immense numbers.

The Secretary, Mr. J. H. Kitchen, having been called away to Queensland, several items of business were held over till his return.

The following new members were elected: Mrs. Clough Forest Hill, South Yarra; Mr. Jensen, Sale.

The meeting broke up at 10 p.m.

South Australian Beekeepers' Association.

"ON SURPLUS HONEY."

By MR. E. A. COLLMAN, OF MOUNT BARKER.

A VERY large part of the science and practice of modern beekeeping might be fairly included under the above title, as the obtaining of surplus honey is really the ultimate aim of almost all who keep bees, whether they devote their attention more particularly to the direct production of honey or to the breeding of the best bees for the purpose for sale to others.

In this paper I can only touch lightly upon many points which are both important and interesting, and shall confine myself almost entirely to that part of the subject which has come under my own observation during the time that I have been engaged in the pursuit, a period of about twenty months.

One of the first points to be decided in starting beekeeping is what style of hive to adopt. Although I have had but little practical experience with other patterns, I am decidedly of opinion—and I think this is borne out by the large majority of beekeepers—that the standard Langstroth is, on the whole, far ahead of all others. The following remarks must therefore be taken as referring to hives taking the Langstroth frame. The bodies and second storeys of all the hives in an apiary should be of exactly the same measurements, and rabbetted top and bottom, so that they will tier up to any height. The floor board should be movable, and should not project beyond the body of the hive at the back or sides. The entrance should be cut out of the floor board, and not out of the hive. The frames should run from back to front, to ensure sufficient ventilation in hot weather.

The best kind of covering to use over the frames in winter is one made of sugar matting; the bees cannot bite it, and it ventilates well. In summer the bees are rather apt to build comb between these mats and the top bars of the frames, so that a piece of hessian or some other coarse open material answers the purpose best, although the bees will gnaw holes through it sooner or later. American-cloth seems to me altogether too airtight for this climate; in winter the underside will often be dripping with moisture, if the bees are not clustering immediately under it, while in summer it does not allow the heated air

to rise through it. The only mat of this kind I ever tried brought on dysentery in a few hours.

The direction in which the hives face is of comparatively small importance, though an easterly aspect seems to be about the best. They should not be placed on high ground, or exposed to strong winds.

In my district *overstocking* is practically impossible in a good year; and after careful observation this season—a decidedly poor one—I cannot find that 200 colonies interfere with each other to any appreciable extent in this respect. The main source from which our surplus honey is obtained is the various varieties of Eucalyptus. Without them this colony would be a very poor place for bees. But they are, as a rule, very irregular in their times of blossoming. The "red gum" (*Eucalyptus rostrata*) which blooms about every other year, usually during January, yields an immense quantity of very richly-flavoured honey, and is perhaps the most important of our honey-bearing trees. The "blue gum" (*E. leucoxylon*) remains in blossom for a very long period, and produces an exquisitely-flavoured honey, probably unequalled by any in the world. The flowers are large, and a drop of honey may often be shaken out of each; while I have seen a sudden jerk to a branch full of blossom bring down quite a shower of nectar. For some reason the bees do not gather from it so freely as from the red gum. The bloom of the fruit trees and hedges yields a very useful amount of honey and pollen, but as they flower when broodrearing is at its height, but little surplus is usually stored from these sources. Another valuable plant for bees in our locality is a species of buglos, which produces a considerable quantity of honey and dark-blue pollen during November and December; but it is such an exceedingly troublesome weed that I should not advise its introduction to places free from it at present. The dandelion or Cape marigold, where it is abundant, yields a large quantity of forage, although the honey gathered from it is not of the best quality.

The beekeeper should observe the date at which the various plants in his neighbourhood come into bloom, so that his hives may be "boiling over" with bees ready to gather the honey directly it is available, as it often happens that the year's harvest has to be gathered in a few days. Almost everyone who keeps bees will sooner or later reach the point at which increase in the number of his hives is not wished for, and the question will arise how to prevent swarming, and at the same time to produce the largest amount of surplus honey. If the honey flow is short and comes early these two conditions may

sometimes both be attained, as when honey is plentiful swarming may be to a large extent prevented by the use of the extractor, combined with plenty of room given at the right time; but it frequently happens that during the swarming season there is only sufficient honey to be gathered to sustain the colony, and should a few of the best hives store a little, the attempt to extract it would be pretty sure to induce robbing. In such a case as this, if the colonies are strong to begin with, it is almost impossible to prevent swarming. It may be delayed, and in some cases put off altogether, by placing frames of foundation in the centre of the brood-nest, or removing frames of brood to weaker stocks; but as soon as all the hives are full—which under favourable circumstances will soon be the case—this must stop, and then most of them will swarm. Perhaps the most satisfactory plan is to allow or make one prime swarm from each colony, and reduce to the original number by uniting later in the season. In a good season most honey is obtained with a moderate increase; but in such a season as that of 1884-5 each stock may be increased four or five fold, and yet have all tiered-up and crowded with bees at the time when the red gums commence to bloom. One of the surest ways to prevent a second swarm from issuing is to introduce a virgin queen within two or three days from the date of the first one, destroying all queen cells at the same time, and giving additional room as fast, but no faster than, the bees can utilise it. If the hives are being worked for comb-honey, a good early swarm will often get the "swarming fever" three or four weeks after being hived, even though all available space for surplus has been given them. The rather troublesome plan of taking out all queen cells and returning the swarm, is frequently unsuccessful, and if returned a second time they will probably kill the old queen, and "sulk around" till the first one hatches, and then swarm again. Certainly the best plan in the event of a stock having the "swarming fever" in the middle of the season is to hive the swarm on full sheets of foundation, and extract about every three days for two or three weeks, when they may be tiered-up, or have sections given them, or else to move the sections at once from the old to the new hive, only putting starters in the brood frames. By the first plan I have known a swarm to fill all their frames with comb, and yield fifty pounds of extracted honey within a week after being hived. By the second plan a much smaller quantity of surplus will be obtained in the shape of comb honey, and the stock will not be strong at the end of the season. The production of *extracted honey* requires

less labour, and will in the end be found more profitable than working for comb honey; but a neat section box nicely filled with translucent comb and sealed, as only the bees can seal it, with snowy capping, is such an attractive object that there will always be a demand for them, while many people much prefer to eat honey in the comb, and are willing to pay for it the higher price which the extra cost of production entails. If the hives destined for extracting have been properly managed the bees will require little or no persuasion to begin work in the upper storey, which as a rule should be placed on the hive as soon as the honey flow commences. If the bees are storing honey in the brood nest, and building little pieces of comb on the edges of the frames and in all other available spaces, it may be taken as a sure sign that they are ready to move "upstairs." The arrangement of the combs must be regulated to a certain extent by the exact circumstances of each colony. It is often advisable to move at least one frame of brood to the upper storey, together with any frames from the lower storey, which contain little or no brood, supplying their places with empty combs or full sheets of foundation placed near the centre of the brood nest, so that the lower storey may be as full of brood as possible. The frames moved up should be alternated with full sheets of foundation, or better still, with empty combs, if such are on hand, and only nine frames should be used in the upper storey. The queen will frequently deposit eggs in the lower part of several of the upper frames, but this is a small drawback. She may be prevented from doing so by placing an "excluder zinc"—the perforations in which will admit workers, but not a laying queen—between the upper and lower sets of frames; but the bees do not like them. Should the queen fail to lay in the outside frames below, they may be exchanged with any containing brood from "upstairs." As bees usually work downwards more readily than upwards, the new combs are sometimes placed in the lower storey, but when they are willing to move up, the other plan is preferable. The frames to be extracted should be numbered on the top bars, so that they may be returned to their former places. The plan of removing all the bees from the hive that is being extracted, caging the queen, &c., as sometimes recommended in books, is too slow and cumbrous where many hives have to be done in the day. The honey should be extracted as soon as the combs are full, and before they are sealed over. To wait until it is sealed entails a large amount of extra labour on both the bees and their master, and very considerably reduces the crop.

If properly cared for, honey extracted when freshly gathered is equal in all respects to that ripened in the hive. If there is much uncapping to be done, it is worth while to have a can specially for the purpose, with a sieve fixed about halfway down to catch the cappings, and a gate at the bottom to draw off the honey which drains from them. The honey should be run from the extractor into a bucket or wide-mouthed can through a piece of fine net, which will catch any small pieces of wax which may have dropped into the extractor, and carried at once to the ripening cistern. It is convenient to have enough of these cisterns to keep each day's honey separate. A capacity of about 400lbs. is a convenient size. Each should be provided with a honey-gate to draw off the honey from the bottom, as after standing a few days there will usually be a certain amount of scum composed of fine particles of wax, which should be skimmed off. The room in which the honey ripens should be as warm as possible—one facing north-west or north will answer the purpose best. In such a room the honey will be thoroughly ripened in from about three to six days, according to its quality and the weather, when it may be run straight into the tins or glasses ready for market. Care expended in neatly labelling and carefully getting up the packages will be amply repaid. Hives should not be extracted too late in the season, unless they have also an abundance of sealed honey to winter on. This is not so important as in a colder climate, but late-gathered honey is usually of poorer quality, and if the flow ceases suddenly, the combs may remain unsealed through the winter, which I think injurious. In order to produce *comb honey* of the best quality it is necessary that honey should be coming in fast. Unless this is the case the boxes will not, as a rule, be well finished, and as they have to remain in the hive for a longer time the capping of the cells is often slightly soiled by the constant passing of the bees, and it loses the snowy whiteness which adds so much to the beauty of sections rapidly filled and removed as soon as finished. Little difficulty is usually found in inducing bees to commence work in boxes if there is plenty of honey to be gathered and they have a sufficient force of workers; but if under these circumstances they still delay, they may usually be set to work by placing a few partly filled boxes from another hive, either with or without the workers which are clustering on them, among the empty ones, or by hanging a frame of sections in the lower storey, and as soon as they are partly filled moving them to the upper storey. Some beekeepers claim that they can obtain more *comb honey* by reducing the brood nest to seven or

eight frames when placing boxes on the hives. This may be the case when the season is short, but during a prolonged flow of honey I do not think that the strength of the colony would be properly kept up, and the sections are more likely to be spoilt with pollen. The bees will usually enter and fill boxes more readily if hung in the lower storey, but they will not finish them off so quickly in that position as when they are at the top of the hive. After trying several patterns of section racks, I still prefer to make them in broad frames. Seven of these frames, each holding eight one-pound boxes, should just fill the upper storey of the hive, leaving about a quarter of an inch at the side to facilitate removing the first frame. It will be found advantageous to have a few half-storeys, taking a shallow frame which holds four boxes. These may be placed on any colonies not quite up to the full working strength, and the boxes from them when nearly finished may form the upper layer in a full-sized storey, empty boxes being placed under them in the lower half of the frames. As hives are generally placed with the front about an inch lower than the back, the section combs should not run parallel to the frames below—that is, from back to front—to ensure their being built straight in the boxes. They also allow of ventilation much better when so arranged. When thin foundation made of pure wax can be obtained, I should advise the use of full-sized starters in all the sections, though very good boxes may often be obtained with strips an inch wide. Separators should always be used with the ordinary sections, which measure nearly two inches wide. It is said that narrower ones may be worked without, but I cannot speak from experience on this point. It is a good plan to rub a little clean grease on the underside of the bottom bar of the broad frames; what little comb is then built between them and the frames below will split off with little or no difficulty. It is not usually advisable to have more than two tiers of sections on a hive, unless an unusually strong one, as it increases the chance of having a number of unfinished boxes left when the season closes. These may be extracted and laid by for next year. The boxes should be removed as soon as possible after being finished, but not before. If kept through the winter, *comb honey* will sometimes ooze or sweat. Some have thought that this is owing to its being taken from the hive too soon after being sealed. If left in the hive for a long time, it certainly becomes much thicker; but I think the sweating is caused by absorption of moisture from the air, and it will rarely occur if the combs are kept in a dry and tolerably warm place. If exposed to a low temperature, some kinds of honey will granu-

late in the comb, even when sealed over; but this seldom happens. Feeding back extracted honey to be stored in sections I have never tried, but it is not recommended by the best authorities on the subject, except occasionally, to complete nearly filled sections. Anyone who tries it with the expectation of securing the results achieved by the author of "Blessed Bees" will probably be "a sadder and a wiser man" afterwards. I regard the discovery of *comb foundation* as one of the most important in modern beekeeping, and I believe it will soon be more widely used than at present. As a general rule I never put a frame into a hive unless completely filled with foundation. In a good season foundation is paid for twice over in the extra amount of honey which may be extracted from a swarm during the first fortnight; and in a season like the present, if hived on full sheets, they will fill their hives with perfect worker combs and rear a large amount of brood, when, if hived on starters only, they would, in our district at least, require feeding liberally to prevent starvation, and they would exhibit a strong tendency to desert their hive. Losses round Mount Barker have been very heavy this spring from the latter cause with those keeping bees on the old system, as the new swarms have been unable to gather enough to build combs and supply themselves with food. Foundation for brood combs should be five or six square feet to the pound; if the frames are wired there is no advantage in having it thicker. For section boxes the wax should be of the finest quality, and about nine or ten square feet to the pound. It has been stated that during a rush of honey the bees do not thin down the base of the cells, but merely build on to the walls; but this I believe to be a mistake. I have examined combs which have had a considerable quantity of honey stored in them within twenty-four hours of the foundation being placed in the hive, and have always found that the first thing the bees do is to reduce the base of the cell to the thickness of natural comb. This may easily be observed if a sheet of foundation, part of which is still unworked, be held up to the light. Another great advantage of using full sheets of foundation is that the raising of drones is very much limited, and may, in some instances, be almost entirely prevented; though, should a stock determine to have drones, they will rear them in worker cells rather than be denied. I think the amount of honey lost by having an unlimited number of drones is generally under estimated. They not only consume it themselves, but they occupy space and time which might otherwise be devoted to worker brood. As to the respective merits of the *Ligurian* and

black bees I shall not say much, as I believe they are to form the subject for discussion at a future meeting. The *Ligurians* certainly work better, especially in a poor season; while for comb honey that stored by the blacks is superior both in appearance and keeping qualities. In conclusion I would advise all, but especially those who intend to produce honey for market, to put quality before quantity, as the surest way of securing for honey its rightful place as a delicious and health-giving article of diet, and of removing the delusion under which even our legislators appear to be labouring, that it is *merely* a luxury.

DISCUSSION.

Several members asked questions respecting observations made in the paper, which were answered and explained by Mr. Coleman. In respect to the best material for covering the tops of the frames, some members thought "American cloth" retained the moisture too much in winter, and the general opinion seemed to be that two or three thicknesses of unbleached calico or of duck was the best, especially in low-lying and cold localities. Sugar-mat was considered to be a good material for warm weather. In regard to feeding when there is a dearth of honey, a question was raised as to which feeder and kind of feeder was best. It was generally thought that the "Simplicity" was best, but it should have some hot wax poured through it to make it syrup-proof. Several contrivances were named, such as mustard tins perforated, and reversed when filled; also sardine tins, "bamboo" troughs, inverted glass bottles, &c. The best feeding material was thought to be a syrup made of equal parts of brewers' crystals and water. Mr. A. E. Bonney recommended beekeepers to save as many frames as possible of Cape Marigold ("*Cryptosemna calendulacea*") honey, and use for feeding, as it was not very palatable for human beings but very useful for bees and for strengthening the colonies. The discussion was continued for a considerable time after the chair was vacated, and the meeting separated at a late hour.

ORIGINAL CONTRIBUTIONS.

Beekeeping.

BY W. ABRAM, MANAGER OF THE ITALIAN BEE COMPANY, PARRAMATTA, N.S.W.

(Continued.)

PART III.—THE BERLEPSCH AND THE LANGSTROTH HIVE.

HAVING described the Berlepsch Hive, I shall now proceed to compare it with the Langstroth, as it, or hives of similar construction, are in most general use in America and

elsewhere, and I shall endeavour to give satisfactory reasons for my preference of the first-mentioned. In both hives the honey chamber is over the brood room, as it has been proved that the bees prefer storing their honey above the brood, and at first sight it would appear that the principal difference between the two is that the Langstroth Hive is opened at the top and the frames lifted out, while the Berlepsch opens from the back and the frames drawn out, while the frames of the former are much broader but not so high as the latter. This may seem to many of very little consequence, but in my opinion it has an important influence on the working of the bees. Anyone who has found bees in their wild state in trees, &c., &c., will at once admit that they always select a place for their home which is much higher than wide, and there is no doubt that the nearer we can approach to their natural habits the more likely are our arrangements to be successful; therefore, I contend that the high, narrow frame is more in accordance with their nature than the low, wide one. Further, it is observed that if we blow a little smoke on them they will always try to run upwards, even against the smoke, if it is not very strong, and therefore even if blown downwards at first many of them will soon begin to ascend again and collect in a corner where the smoke is not so heavy, and even fly about or settle on the outside of the hive, while as the smoke disappears, they will rush up between the combs and attack the disturber of their home; then, too, as those that are abroad are constantly returning they help to swell the number of angry occupants, and to complete the confusion. If a honey box has been taken off and put to one side, all the bees in it having filled themselves with honey and finding out soon that they are separated from their queen and home, will make their escape and fly off and join their excited comrades, so that before the operator has nearly concluded his observations and completed whatever operation he may have opened the hive for, there is such an excited crowd about him, that it is frequently almost impossible to proceed further, and quickly he has to shut the hive up. One of the apparent advantages of the Langstroth, seems that you can take out any particular frame you may wish, without interfering with the others, but this is not so advantageous as might appear at first sight; even suppose you want to see the queen you cannot tell which frame she may be on, as she is constantly moving from one frame to another, looking for empty cells wherein to deposit her eggs, and while you are taking out the one you think most likely, her Majesty, especially if she is strong and

active, will probably run off the comb and be lost to your sight amongst the crowd, and you may have to take out all the frames before you can find her; then again in a strong colony, with combs full of honey and brood, the frames are more difficult to handle, and as the bees sometimes build their combs a little crooked leaving only the $\frac{3}{16}$ of an inch space between them, it is almost impossible to take a frame out without running the risk of crushing some of the bees (perhaps the queen herself) or uncapping many of the cells full of honey or brood as the case may be; then again you have to be careful in putting the frames back to place them the right distance apart, or a similar accident may occur, or you may place them too wide apart and then the bees will begin to make combs between them. Now in the Berlepsch hive, as I have already shown, the frames are made high and narrow in accordance with the nature of the bees, and if you want to see the queen and ascertain the state of the brood, or have any operation to perform, you can do either with less annoyance to the bees and mere ease to yourself. First, if you want to have a look, to see if there is enough honey for taking away, you find out that by taking off the door and by looking through the glass division if the first comb is full, or nearly so, there is sure to be plenty of honey to spare. If you want to look in farther, take off the glass division and blow a little smoke at the bees, when they will all run inwards and upwards; then take out the first frame, and if you wish to see the Queen, look carefully over the outward side of the second frame; if she is not there, examine both sides of the first frame before putting it into the frame-holder. Then take out the second frame again, having a look first over the outside of the next, and examine both sides of the one in your hands, and so on till you come to the last frame at the entrance, always using a little smoke, but not enough to stupefy the bees. The last comb I seldom take out, as there is rarely brood in it, but always plenty of pollen and some honey, and if you have not discovered the Queen by this time, leave her for the present and try another time, endeavouring to be quicker in taking out the frames. In putting the frames back push them close up to each other into their proper position. If the bees are at work in the honey room they will not be in the least disturbed while this is going on, and the bees that were driven back by the smoke will go up there, while those returning home will do the same, and be out of your way till you have finished your operations. Again, for taking out combs from the brood room to extract, I consider my hive to be preferred, as

you can see at once through the glass division whether there is honey in the first frame, and if this is the case, you can be certain that the next two or three frames are full. These you can take out and replace with empty ones almost without disturbing the bees at all, or interfering with their work. The bees will work all the harder to replace the stores that they have been deprived of. Now, in the Langstroth or any other hive that opens at the top, this cannot be so readily done, as in these the bees store the honey in the side frames, and the whole hive must be opened up, and the occupants disturbed before you can even ascertain if there are any combs ready for the extractor. Further, I may remark that as all hives that are opened at the top cannot be placed one over the other they require more room in the beehouse, while the Berlepsch hives can be placed on shelves in two rows, one over the other, the lower shelf about 18 inches from the ground, and the upper about 4 feet, the hives being about 18 inches apart, so the same space will hold double the number without any inconvenience therefrom, and the bee master can conduct his operations from behind with much greater ease and comfort to himself and his industrious little workers, as he is well shaded from the sun, and he does not interfere at all with the labour of the various colonies. Another objection I have to the American hives is, that they generally have no division between the brood and the honey room, consequently the bees are likely to carry pollen up sometimes, and mix it with the honey, which spoils the flavour and taste of the latter, and even the Queen may perhaps ascend and commence to lay her eggs in the honey frames, while in my hive, as they have to pass up through a small hole from one room to the other, they will not carry pollen with them, and there is little danger of the Queen ever ascending from below.

In the brood room, also, there is no division board either, and consequently a weak swarm has as much room as a large one, and from practical experience it is found that a weak swarm will do better if it has not too much space. Now in my hive the space can be arranged to suit the swarm, as a sufficient number of frames, say four or five, can be put in, and then the glass division can be put in and closed all up till the frames are nearly filled, when more can be added as required, till the room is full, and then they can be let up into the honey room. Then when the honey season is over, and winter coming on, some of the frames can be taken out, leaving them five or six only, as they do not want so many combs as in summer, and can keep themselves much warmer in a smaller space. In

conclusion, it is found that bees seldom fasten the comb to the bottom of the frame, but leave a small open space to pass through, neither do they fasten them to the sides of the frames within three or four inches of the bottom, so in a frame 10 inches high the comb is fastened only about 6 inches down from the top, while in a frame 14 inches high it is 4 inches more on each side, and consequently the combs in the high narrow frames are much more secure for transporting or extracting, as well as being easier handled. Moreover, as already stated, they are more in accordance with the nature of the bees, and a comb only 8 inches wide will be built straighter than one double that width. The comparison I have now drawn between the two kinds of hives should, I think, convince any unprejudiced person of the superiority of the Berlepsch in almost every respect, and I shall be happy to afford any further information on the subject that I can, or if anyone is desirous of seeing my hives he has only to come and see me at the Italian Bee Company's Apiary, at Parramatta, when I shall have much pleasure in showing him every particular with regard to the practical working of the hive just described. I might add to the foregoing that section boxes can be used in the Berlepsch Hive, and it is most suitable, and well adapted for them, but I need not enter upon this subject at present, as I shall probably treat of it at a future time, and for the beginner I think the small frames are the best, and the bees store honey quicker in them.

CORRESPONDENCE.

(To the Editors of the Australian Beekeepers' Journal.)

THE Beekeepers' Club, formed some time ago, is without the least doubt doing a great amount of good, but in my estimation mainly the beekeepers about the metropolis are those who derive real benefit from it. I think the time has now fully come when branch associations should be formed throughout the colonies, and once a year a Beekeepers' Convention held, to which delegates should be sent from every district, to report on their successes, &c. The question, however, arises, how can we get the respective districts at once to take action in this important matter? Now, gentlemen, I think it could be done very easily if an experienced beekeeper were engaged by the Melbourne association for the purpose to

travel through the colony, visit the various districts, have personal interviews with the most prominent beekeepers in each locality, convene a public meeting, deliver a lecture on successful beekeeping on modern principles, take, after concluding the discourse, down names of those who are willing to form a local committee for the establishment of a branch association, and also try to get in every place subscribers for the *Australian Bee Journal*. Now, gentlemen, I am very well certain that if such a plan could be adopted, there is not the least doubt there would be a general rising in Victoria towards the one great object we have in view. If, at every lecture, either a charge was made, or a collection taken up to defray expenses, I do not think the association would likely incur any great risk.—I remain, gentlemen, yours very truly,

H. NAVEAU.

Hamilton, 11th Feb., 1886.

(To the Editor of the *Beekeepers' Journal*.)

DEAR SIR,—There are a few words I would like you to put in the *Journal* on bee flowers. I am a keeper of bees, and I find that one of the best flowers in this part (the Goulbourn district) is the box thorn hedge plant, it keeps in blossom so long. It is crowded with bees, and I find that they make a lot of honey out of it. The pumpkin and the melon tribe I find very good, and they also keep in bloom a long time. The borage and mignonette thrive well in this district (Kyabram,) and are capital bee plants. I find also the rosemary a grand plant for bees on account of its blooming early, and it gets covered with bees.

There are a few questions that I wish to ask. Is the common white box tree which is so plentiful through the Goulburn district included among the Eucalyptus tribe? Also, is there much honey to be found in its blossom? Also, could you inform me are there any seed of the basswood tree and the figwort to be obtained in this country, if so, where? Further, with the two-storey hive should the top frames be put down on the bottom ones, or is there a space to be left between?—Yours, &c.,

DAVID RATCLIFFE.

STANDARD HIVES.—HYBRID BEES.

(To the Editor of the *Beekeepers' Journal*.)

DEAR SIR,—I see that at the meeting of the Victorian Beekeepers' Association the question of adopting a standard size for frames and hives was discussed, and although the

members were not unanimous, the majority advocated the American favourite, the Langstroth. A writer in your first number, signing himself "Drone Comb," is strongly in favour of the British Bee Association's Standard. Now, having some experience of bar and frame hives during the last thirty years, I have come to the conclusion that, except in climates where there are long and severe winters, and bees are kept prisoners for months, it matters very little what sized frame is used for thriving stocks—strong colonies will do well on the largest frames used, while weak ones struggle on best with small frames where the brood can be kept close and the bees not get too much spread. I am not quite sure of the wisdom of advocating one particular size, because it is certainly not proved yet that one size is better than another. There is one point, however, that cannot be too strongly insisted upon, and that is, that every beekeeper should have but one size in his apiary, and should stick to it, and he should have a sample or template for his hives and frames, so that all he gets made should be as precisely alike and interchangeable as possible. For keeping bees in the bush, or any good honey country, I should prefer the large frame, such as the Langstroth or Quinby; but for poorer districts or town beekeeping, I think the smaller frame, such as the old Woodbury, or the new British Standard, is better.

An experienced English beekeeper has stated that there is scarcely a pure common bee (black or brown German) to be found in England now—they have all got some Italian blood in them. In several stocks that I have got from various parts of the colony I found the bees marked with two marks of orange-yellow colour on the first abdominal segments, observing that it was a bee of hybrid race. A few days ago, on the side of one of our mountains, I saw black bees swarming on white and red Dutch clover. Now, as it is asserted that black bees do not visit red clover because their tongues are not long enough to reach the honey at the bottom of the deep floret, I thought I had now established the fact that *they did do so*, and I called the attention of a friend to the numbers of black bees feeding on the large red Dutch clover. To be quite sure, I caught two or three, and examined them, when lo! on each bee was a pair of orange marks on the back of the first abdominal segment, accounting at once for its long tongue. These bees, I believe, were wild, and hived in trees, as we were a long way from where any bees were kept. It appears likely, therefore, that all our bees will gradually become hybridized with the Ligurian bee.

SIGMA.

A CHEAP LANGSTROTH HIVE.

(To the Editor of the *Australian Beekeepers Journal*.)

SIR,—In the endeavour to induce box-hive men to adopt the movable frame system, with all its attendant advantages, one is constantly met by the objection that the hives are very expensive and beyond the reach of cottagers, and others of limited means. It is, therefore, the writer's aim to show how a cheap and thoroughly efficient hive can be made to take the standard Langstroth frame, the total cost of the materials not exceeding five shillings. I have been informed that others have been working in the same direction, though I have not seen their result.

If a kerosene box be measured, its inside dimensions will be found to be about 19in. x 11½in. x 9½in. or very nearly the exact size required to suit the Langstroth frame. The average kerosene box is ⅝in. too long and this amount must be cut off, but the exact length inside the hive should be 18⅝in. so as to allow ⅜in. clear outside the frame. The depth should also not be less than 9½in. to allow the same clearance beneath. The ends of the hive are rabbeted ¼in. deep by ⅝in. wide, and a piece of hoop iron of sufficient width is nailed along the rabbet to support the frames on its edge and so prevent them from being fixed down by propolis.

The bottom board is made of the top of the kerosene case and has two cleats 2in. x 1½in. nailed under it, one at each end, each cleat consisting of two pieces of ⅞in. stuff from the end of another box.

A small fillet, ⅜in. x ¼in., is nailed to the bottom board inside the hive, to prevent the latter from sliding off. The entrance is cut out of the hive, and is ½in. high by the full width to allow of the necessary ventilation in summer and sufficient room for the bees to pass when the gum trees are in bloom. An alighting board is made of the full width also, and slopes down to the ground. It is fixed by a slotted piece of hoop iron at each side, and this slips over the head of a nail driven into the hive, thus allowing of easy removal.

The cap, which is flat-topped, is constructed of another kerosene box, and should measure 18⅝in. x 14½in. x 7in.; it is kept from sliding off by a strip 1½in. x ⅜in. nailed to it all around, and projecting downwards ½in. to cover the joint. A rack, to hold 24 1lb. section boxes, is then placed on the frames, and provides means of securing the most popular form of comb honey. The cap is purposely made 7in. deep, so that the 1½lb. sections may be used if required. When the whole is well painted outside, it is finished,

and will compete successfully against the most expensive kinds of hives sold.

Anyone with the most rudimentary carpentering skill can produce such a hive as this, and if he makes it himself it need not cost him more than 5s., as follow:—

Kerosene cases	2 @ 9d.	1s. 6d.
Frames, in the flat	10 for	1s.
Section boxes .. 24 @ 5s.	100	1s. 2½d.
Paint	2lbs. @ 7d.	1s. 2d.
Nails	0s. 1½d.
Total	5s. 0d.

These are Adelaide prices.

It is hardly necessary to caution anyone against using a case into which the kerosene has escaped, as the bees in that case would probably soon leave the hive. The flat-topped hive has the advantage of being easily protected from the sun by a projecting cover placed upon it and held in position by a brick. Such a cover can be made of a few palings, secured together by two cleats, which thus provide an air space between it and the hive, and the protection thus afforded prevents the combs being damaged by excessive heat.—I am, &c.,

C. F. CLOUGH.

Adelaide, 5th Jan., 1886.

STANDARD FRAME FOR AUSTRALIA.

(To the Editor of the *Australian Beekeepers' Journal*.)

SIR,—In the December issue of your journal there is a letter signed "Drone Comb," in which the writer says "he desires to discuss the question concerning the size of the frame to be adopted by the Australian Beekeepers' Club," and with your permission I would like to make a few remarks on the same subject. It is a most important question, affecting not only the apiarists of Victoria, but those throughout Australia; moreover, it is one that should be settled as speedily as possible.

In South Australia a great variety of frames have been introduced, and tried, with the result that the Langstroth is now almost universally adopted. The advocates of a smaller frame, who are inexperienced, would do well to be guided by the fate of the Dzierzon and another hive in this colony. About two years ago, when scientific beekeeping became popular, the Dzierzon Standard hive, and a hive with frames similar to the British Standard, were quite extensively manufactured, and sold readily for a few months. But people soon found out the disadvantages of these small frames. They discovered that they had no show against their neighbours who used the Langstroth hive and frame, and the demand for small

frame hives stopped as abruptly as it had commenced. In my own apiary I have carefully experimented with a variety of frames, including the British Standard, 14in. x 8 $\frac{1}{2}$ in.; Langstroth, 17 $\frac{5}{8}$ in. x 9 $\frac{1}{2}$ in.; Dzierzon, 9 $\frac{1}{2}$ in. x 10 $\frac{1}{2}$ in.; Quinby, 17in. x 11 $\frac{1}{2}$ in.; and L. C. Root's hanging frame, 16 $\frac{1}{2}$ in. x 11 $\frac{3}{8}$ in. These experiments convinced me of the superiority of the Langstroth for honey production, although for rapid brood rearing I prefer a deeper frame. One great objection to small frames is the extra number required, thereby adding to the cost of the hive and increasing the difficulty of manipulation.

In America it is generally conceded that although in the Northern and colder States a different shaped frame may be superior, the Langstroth is most suited to the Southern States and a warm climate.

There appears to be no occasion in a discussion of this kind to compare the merits of English and American apiarists; but since "Drone Comb" has done this, I would ask him what was the condition of apiculture in England before the introduction of American methods and appliances? Until the publication of Mr. Cowan's excellent little book there was no practical work on modern beekeeping published in England; at least if there was, I am not acquainted with it. A glance at the British Bee Journal of say five years ago, will show what old-fashioned ideas were in vogue, and what queer looking hives were advertised for sale. If we are indebted to the Americans for anything, it is for showing us how to make apiculture a certain and profitable pursuit.

With regard to the details of construction of frames, "Drone Comb" instances metal corners as an admirable invention. I have tried these, and do not find them satisfactory, because it is not practicable to have combs at a fixed distance apart if they are frequently manipulated. Frames with tin corners are simply an abomination. I acknowledge that sagging of the top bars is most undesirable; but where this occurs it is no proof that the size of the frame is at fault, it simply shows that there is an error in construction. Top bars are usually too slight. Let them be made at least $\frac{5}{8}$ in. deep, and there will be no occasion for the use of central bars to support the combs.

I am a great advocate of hives of the simplest form of construction, and am certain that they will prove the best in the end. Where foul brood is prevalent, simplicity is all important, because the labour and difficulty of eradicating this disease is much increased by the use of complicated hives. Unfortunately in this country all beekeepers must expect to experience foul brood sooner or later, and

the hive that has the fewest parts is sure to become the most popular. In view of the elaborate and costly hives used in England it is no wonder that Mr. Cheshire advocates his laborious phenol cure.

"Drone Comb" recommends that hives should be made to fit either the British Standard or Langstroth frames. That is to say, one frame would hang cross-wise and the other length-wise of the hive. But the objection to this is that, in hot climates like ours, it is indispensable the combs should stand at right angles to the entrance, so as to permit of perfect ventilation, and whilst such a hive would be right in this respect for one set of frames it would be all wrong for the other.

I am confident Victorian apiarists will decide upon adopting the Langstroth frame in preference to any other, and will take this opportunity of suggesting the importance of at once fixing its exact dimensions. Many of the so-called Langstroth frames vary a little in size, which is sometimes very annoying.

Would it not be possible for the beekeepers' associations in the different colonies to communicate with each other and thus determine the standard size for the Australian Langstroth frame?—I am sir, your obedient servant,

A. E. BONNEY.

(To the Editor of the Beekeepers' Journal.)

DEAR SIR,—Business having during the end of the last month called me to your colony, I was gratified to note the amount of interest which was being directed towards apiculture, and during the time spent there had many opportunities of becoming acquainted with what was being done in the way of beekeeping generally. I noticed particularly that your season appears to be considerably later than ours here, and that in all parts visited by me a very steady flow of honey was coming in stocks, showing activity and wonderful strength.

In October last I sent to a friend in the North-east half-a-dozen hives with written instructions how to use the bar frame, and hearing from him in December, not only that he had succeeded in obtaining six swarms of bees in the bush, but of wonderful progress they had made, I was anxious to see for myself especially what source the honey was coming from.

The first swarm was caught and hived about the middle of the month (October) and other five during the remainder of the month. Since that time I find every comb nicely made (they having been supplied with starters only,) have thrown off seven swarms, and are now splendidly strong, and capping honey in every frame. One colony—the first hived—are working sections very nicely in a half-storey

super, while three others are filling in brood frames at the side of the brood nest, and will be ready to move up in a week or two if flow of honey continues. This, I think, very good work for an amateur with no previous experience of bar frames; but the important point is the source of revenue, knowing that this is what is usually termed the off year for honey. On this point I was informed that the supply came in the spring from clover which flowered very freely on account of quantity of rain later from peppermint, box tree, and a few gums, but at the present time bees are working well upon that much-abused plant, the Scotch thistle, which flourishes even in some of the streets of South Melbourne, and is to be found over the length and breadth of the country. This plant supplies both pollen and honey, the bees returning to the hive looking like millers—dusted all over. In addition to this many small flowers abound in the bush, which all yield more or less honey and pollen. In travelling through the country I particularly noticed that on the ranges the box trees are now flowering very freely, to be followed in a short time with peppermint, and a few blue gums here and there, but everywhere gums of all sorts were freely budded for next season, and you will doubtless have a grand flow next year from the Eucalyptus.

All up the railway line, and in many places I passed, I observed bees in the old gin case hive at work, and the question put, Do your bees pay? always brought the answer, Yes, very well. One man told me about 30s. a year per hive. If this is so under the old style, how much better would the result be by using the bar frame and extractor, to say nothing of section honey. I was anxious to take a run to Gippsland, having heard splendid accounts of honey prospects there, but want of time forbade; but from what I saw and heard in the north-east, it is beyond speculation that a little attention will yield handsome profits. In fact I was credibly informed that many of the selectors in that district were enabled to pay their yearly rental simply from the money supplied by keeping a few boxes of bees.

I should now like to show something of the other side of this pleasing picture, and which constitutes the strongest possible argument for the adoption of the bar-frame hive. To my dismay I found that foul brood had made its appearance in the six colonies of bees above referred to, or rather in four of them, and this notwithstanding the amount of prosperity shown.

How it came there, or from where, are questions not easily answered. My own opinion is that the fungoid is carried by the bees from some plant to the hive, and that an all-wise Creator has so determined that a

check may be kept upon a too rapid increase of the race. Investigation gives to man the knowledge of the presence of this disease, and the way to overcome it. It is just here where the bar-frame shows its utility, enabling the apiarist to detect the first presence of disease, and then to treat for its cure, which may be easily effected by a little careful application of remedies already proved by many successful apiarists. Note, by the way, that success in beekeeping depends upon careful attention to details, as laid down by men of experience. For instance, it would be sheer folly to go from a diseased hive to a healthy one without first well washing the hands in a strong disinfectant, such as carbolic acid; and yet scores of beekeepers never get entirely free from foul brood, simply by ignoring this necessary precaution, and so with other measures already proved as useful and necessary.

In the case referred to I have little fear but that the disease will be easily stamped out, as the bees are now under treatment under Cheshire's system of Phenol.

Doubtless you will from time to time give considerable space to the consideration of this subject. I shall be pleased at some future occasion to give my experience *re* the treatment of this plague, having had already considerable experience of it.

In conclusion, I would beg to urge the adoption of a standard frame throughout the colonies, and am glad that your evident leaning is toward the Langstroth. It is conclusively proved here to be by far the best for practical purposes, and has been generally adopted throughout this colony, thus giving to beekeepers an easy method of interchange, and simplifying all the operations of the apiary.—Yours,

L. T. C.

Adelaide, 1st February, 1886.

NEW BOOKS, REVIEWS AND EXTRACTS FROM FOREIGN JOURNALS.

THE late journals from both England and America are chiefly occupied with articles and correspondence on *wintering*, a matter that is of small interest to most Australian beekeepers, for there is scarcely a day throughout our winter on which bees cannot fly and even get stores, except in cases where the apiary is over 2000 feet above the level of the sea. There is one important and interesting item, however, which should be noted—that is the question of the *shiny bee*, or bald bee disease, which many of our correspondents

have complained of, and which in some hives, in our own apiary has destroyed almost all the bees. This disease first becomes apparent by the bees bringing out from the hives small, shiny, and very black bees, and killing or disabling them until heaps are found dead under the entrance to the hive. These bees are only about two-thirds or half the size of the ordinary bee, have small black heads, and are without the hairs or down, which partially cover healthy bees, which makes them look shiny and black. The cause of this disease has been investigated, and it is found to be like *foul brood*, due to a minute germ, "a *Bacillus*," which has been named after a young lady, Miss Gayton, who first discovered its true character, the "*Bacillus Gaytonii*." This disease has frequently appeared in hives and disappeared without any treatment, but in numerous cases the bees dwindle down till only a few are left, which usually desert. In some cases foul brood itself has supervened, which has hastened the destruction of the stock.

Nothing much can be said about this disease yet, except that in several cases where Mr. Cheshire's mode of curing foul brood has been adopted, it appears to have always been successful, and we, therefore, consider it quite safe to advise this treatment in every case where the *shiny bee disease* gets sufficient hold of a stock to prevent its proper progress.

QUERIES AND REPLIES.

QUERIES.

QUERY No. 12.—Will you tell us country beekeepers which are the best Gum trees for honey? P. H. (Glenrowan.)

QUERY No. 13.—Could you inform me, the best way of raising plants of the "*Echium Candicans*," so that they would blossom next summer? BLANTYRE.

QUERY No. 14.—What is the best material to use for producing smoke for quieting bees, and how can I manage it without one of the proper bellows smoker? M. G. (Egerton)

QUERY No. 15.—I find my frames containing section boxes get fastened down to the tops of the frames below, so that in lifting out a frame of section boxes it lifts the brood frames. How can I get over this difficulty? TASMAN.

REPLIES TO QUERIES.

To No. 7.—Your hive is evidently Queenless and you should either unite the bees with some other stock near to it, or if it is a good strong hive, get another laying Queen and introduce it. ED.

To No. 8.—Honey is undoubtedly the best food for bees, but you should be sure that it has not been taken from diseased stocks.

Next to honey, white sugar syrup is best, or indeed any syrup made from good sugar, whether it be white, or light brown. 2lbs. of sugar to a pint of water makes it about right, and it should be warmed till the sugar is quite dissolved, taking care not to burn it. ED.

To No. 9.—It is not at all unusual to find a great falling off in bee food after the spring flowers are over, and weak hives will get quite empty and require feeding. About the middle of January the bees again find plenty of forage from summer flowers and flowering trees, especially the various *Eucalypti*. ED.

To No. 10.—The leaves and bark of the *Oleander* are poisonous, but it does not follow that honey or pollen from the flower is so. A correspondent states that some honey gathered has a strong almond flavour, and supposes this comes from the *Oleander* flower, if this be so, it can scarcely be poisonous to the bees. Perhaps some of our contributors can give information on this point. ED.

To No. 11.—Are the seeds and other parts of the sunflower of any value?

Yes, most valuable; the roots, stem, flower, and seed, each possess some distinct value. The seed is without doubt most useful for fattening poultry, pigs and sheep. Roasted and ground it is a good substitute for coffee. The meal from the crushed seeds makes a most wholesome and nutritious bread.

If the seeds are boiled in alum water they yield a beautiful blue colouring matter, and by expression it is said that at least 40 per cent. of bland oil can be obtained from the raw seed, scarcely inferior to olive oil in value and utility. The cake or pulp, even after the oil has been partly extracted, is superior to *Linseed*, and is a very fattening food for cattle. The fresh leaves also make a good fodder, and when sun-dried, powdered and mixed with bran can hardly be surpassed. The *Stalks* are even useful, for they yield a strong fibre suitable for weaving into textile fabrics. The fresh flowers before the seed matures afford a brilliant yellow dye which stands well, while for Bees the sunflower is unrivalled as a honey and wax producer. W. R. G.

To No. 12.—The best honey-producing *Eucalyptiscem* to be "*Eucalyptus Melliodora*," the Victorian yellow Box, "*E. Rostrata*," the Red Gum of Victoria, or Flooded Gum of N. S. W.; "*E. Calophylla*," the Red Gum of Port Gregory, W. Australia, and "*E. Amygdalina*," the Victorian narrow-leaved peppermint. Nearly all of the common kinds of *Eucalypti* blossom between the middle of spring and during the early summer. W. R. G.

To No. 13.—"*Echium Candicans*," raised from seed, cannot be induced to flower the first year. The plants require fully two years to mature even in a very rich soil. W. R. G.

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THE
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MARCH, 1886.

[PRICE 6D.

PROCEEDINGS OF BEEKEEPERS'
SOCIETIES.

Victorian Beekeepers' Club.

AN ordinary meeting of the Club was held at the Exchange, Collins-street West, on 16th February, at 8 p.m., about twenty members present, and Mr. Ellery in the chair. The minutes of the last meeting having been read and confirmed, Mr. F. B. Miller inquired why it was that in two hives that had produced three swarms each, the bees finally deserted, leaving combs, and in the centre of one a patch of sealed brood dead, and dark coloured; no sealed brood in any other comb. A conversation ensued, and members considered these cases of queenlessness through failure to raise queen after last swarm had left. Mr. Miller also inquired how to prevent bees sealing tops of frames to bottoms of section boxes. The Chairman asked what space there was. Reply: Three-quarters of an inch. He said if more than a quarter of an inch or five-sixteenths at most was left, bees were sure to build comb in it, and that space should be reduced to quarter of an inch.

Conversation on bee plants then ensued, and Mr. Reeves read an extract from a foreign journal, speaking of "*Sedum Sieboldii*" as an excellent plant. One member found his bees visiting the *Portulacas* largely, and another had seen them working on *Gazanias*. Other members stated they did not see their bees on these flowers.

A question as to best method of starting bees storing in glass shade, or cover, was asked. The Chairman explained, and advised

starters of foundation arranged radially round the central ventilating tube. The Chairman then related his experience of an attack of foul brood in his apiary, and his mode of treatment. In one case Jones' method was tried successfully, and in two cases Cheshire's method was being carried out, apparently with equal success.

Mr. Barton related an instance that had just come under the notice of an absent member, of field mice getting into a hive. The bees swarmed out four times consecutively and finally absconded. On examination, two field mice were found domiciled in the hive.

Mr. Grant exhibited a piece of drone comb in which eggs had been deposited; in every cell there were two or three, and in many five or six deposited. He could not find any queen in the stock, and presumed this was a case of *fertile worker*. He proposed to unite the bees to a thriving stock with young queen.

The meeting adjourned at 10 p.m.

*South Australian Beekeepers'
Association.*

THE usual monthly meeting was held at the Chamber of Manufactures, on Thursday, 4th February, Mr. S. Randall in the chair. One new member was elected. Judges for honey, wax, beekeepers' appliances, to be exhibited at the Royal Agricultural Society's Show in March were appointed as follow:—For bees, Messrs. Dollman and Ferrell and Dr. Poulton; for appliances, Messrs. James, Solomon, and Clough; for bee products, Hon. R. D. Ross and Messrs. Conigrave and Page.

PAPER.

Mr. August Fiebig having prepared a paper upon "The Various Races of Bees and their Peculiarities, as observed by an Apiarian," in German, the same was translated by Mr. J. H. Weidenhöfer and read as follows:—

THE COMMON BLACK OR NORTH GERMAN BEE.

In 1855, in Silesia, on the persuasion of a friend who had presented me with a small artificial swarm of bees, I commenced apiculture; much to my sorrow, however, the young queen was lost on her wedding flight, and the colony became extinct. Subsequently a generous neighbour presented me with another swarm, which unquestionably was one of the most common black or North German bees. These inhabit Northern Europe, France, Spain, Portugal, Greece, the Crimea, Northern Asia, Guinea, Cape of Good Hope, and America. The remarkable fact of this race appearing in Guinea and the Cape may be attributed to their having been brought there by Europeans in former times. This race of bees is strong and quiet. The abdomen is perfectly black, and the segments are covered with hair of a light-grey colour. Very seldom does this race swarm more than once, and never more than twice in a season. They increase later in the season, like all other races, and are therefore not profitable in localities where there is an early flow of honey; but in districts where the honey season is late, and the colony in the meantime has numerically increased, the result has been highly satisfactory. They are not much inclined to sting, but when irritated they can become very vicious. The queen differs in colour from the workers, being black-and-brown, and as a rule of large size. There are still some beemasters who give this black bee the preference over all others. In order to procure a rapid increase in my apiary (all beginners are anxious to quickly have a large number of colonies) I was recommended to try

THE HEATH BEES.

I obtained in 1857 two colonies of these. They are more slender in bodily construction, and the segments on the abdomen are covered with hair of a somewhat lighter colour than the black bees. They are only a variety of black bees; in fact, they are hardly distinguishable from them. The queens differ similarly in colour—black and brown—and are famous for their fecundity. Their diligence leaves nothing to be desired. On the least provocation this race stings with a zeal that also leaves nothing to be desired; they also sting while in the act of swarming, which other bees are not known to do. There are,

however, some very tame bees of this race. One of my colonies was fairly quiet, but the other was a thorough satan. The circuit of distribution is very limited: they are to be found in Lüneburger Heide, Oldenburg, Holstein, and Schleswig. The beekeepers in these districts use the round straw skeps, and their dexterity in handling the bees in these old-fashioned hives is interesting to witness. With feeding and skilful treatment they develop the colonies to such an extent that in fourteen days all have completed swarming, and shortly afterwards, when the heather commences to bloom, all the colonies are strong. Those who leave the Heath bees to their natural inclinations will certainly obtain many swarms, but very little honey; they swarm as long as there are any bees left in the hive. This race is adapted to professional apiarians only. The usual increase in colonies of Heath bees is about 200 per cent.; in autumn two-thirds are generally destroyed, and only the best (not those with most honey,) those with a numerous young population and honey sufficient to last them through the winter, are selected and kept. The bees in South Australia are mostly descendants of the Heath bees.

THE CARNIOLEANS.

In autumn, 1858, I received two queens of the then newly discovered Carniolean bees, from the province of Carniolea, in Austria. I introduced them into two strong colonies, and awaited with anxiety the advent of spring. My expectations concerning their gentleness were fully realised; their fertility is marvellous, and their inclination for swarming as great as the Heath bee. Their appearance pleased me better than the latter; the first two or three bands on the body have a dark-brown glitter, and the segments are covered with quite white down. Young bees when on first flight have the appearance of having been smothered with flour. Their flight is quick and good, but what they gather they utilise for brood. They breed extensively till late in autumn. The queens are of a reddish-brown colour, and many a beautiful bright orange, similar to the best North Italian queens. Neither the Heath bees nor the Carnioleans satisfied me. By this time I had heard of

THE BEAUTIFUL ITALIAN BEES

(known in South Australia and America as Ligurian bees,)

of which I ordered and received in spring, 1859, my first queen bee from Herr Dathé, of Eistrup, Hanover, and two from Signor Mona, in Bellinzona, Italy. To my disappointment the two queens from Italy were useless for queen-breeding, and only the one from Herr

Dathé was good for that purpose; I used those from Italy for drone-breeding. The trouble, labour, and amount of money my experience had cost me I need not here mention, still I was not content, because I had seen handsomer bees at my venerable tutor's (Dr. Dzierzon, in Carlsmarkt, Silesia.) I was determined not to rest until I procured a queen of his strain. Finally, in 1861, I received a promise that in August a queen would be ready for me. (A whole year in advance all queens had been bespoken, such was the demand.) When the time arrived I paid the doctor a visit and received a splendid queen. About this time Baron von Hruschka (the inventor of the honey-extractor,) in Dolo, near Venice, had an extensive apiary, and from him Dr. Dzierzon had imported his first colony; from that time these really handsome bees were sent to Germany in large quantities. The bees from North Italy have the first bands round the body of a deep orange colour, and are unevenly marked; those from Venice have three handsome golden-yellow bands, and are evenly marked. The famous old Roman poet Virgil praised the golden-yellow bee in one of his poems, who says:—"There are two sorts of honey-gatherers; the one is of a reddish colour, and their honey is not of a particularly good quality; the other is clad in 'golden yellow,' and gather only nectar and ambrosia." But to return from this digression. There is a decided difference between the queens from North and Central Italy. Seldom does one rear from the former a yellow queen without any black markings, as invariably the bands are of a dark tint, and two or three bands from the point of the tail are black, the best having a black spot on the second, third and fourth band; whereas, from the golden-yellow variety, with a good queen, mostly quite yellow queens are obtained, the others having only a dark shade on the point of the tail. The handsomer the queen the handsomer will be her progeny, and the better do I like them. The Italian bees are the best honey-gatherers; they contract the brood earlier than any others and drive out the drones earlier when requisite. When the honey is coming in freely they contract the brood somewhat more than the aparian desires; it is in such a case that they require watching. They are on the flight early and late when there is anything to gather. The fertility of the queens is always regulated according to the strength of the colony, and still they increase quickly. The gentleness of these handsome bees is generally admitted, although if irritated they can also sting; in such case they are, however, easily calmed with a little smoke. In Germany pure Italian bees rarely swarm. In the Australian Colonies

I believe, after they have been acclimatised they will be more inclined to swarm. On a sunny day it is a treat to see a strong colony of young Ligurians when practising flying in front of the hive, the rays of the sun shining on their bright-coloured bands, giving them the appearance of golden sparks darting in the air. *En passant*, I have reared Italian bees in Germany until my departure for this Colony, about three years ago; I had fifty-five colonies, all uniformly handsome bees. It is a remarkable fact that the bees existing in North Italy are of a deep orange, while those in central Italy are of a bright golden-yellow colour, and in Southern Italy they are black. The Italians appear to be a cross between the black and the Egyptian bees. This has been confirmed by Herr Vogel, of Lehmannshöfel, editor of the *Eichstädter Bee Journal*, and one of the ablest beemasters, who, under the auspices of the Berlin Acclimatisation Society, has proved it by experimenting with these races. The handsomest, most gentle, and most industrious Italians are bred by Dr. Dzierzon, Dathé, Gravenhorst, and several others. They exceed in their several qualities those imported from Italy. The most beautiful bees I have seen, but which I have not yet bred, are

THE EGYPTIAN BEES,

which are considerably smaller than the North German and Italian bees. The first bands are bright yellow, and the breast is of the same colour; the other bands have a black lustre; the hair on the breast and segments is perfectly white. The queens are yellow, almost transparent, and their breast of a blood-red colour. The Egyptians are very vicious, and when irritated are so savage that it is impossible to handle them, and they cannot be pacified. A special peculiarity about this race is that in some colonies, in addition to a fertile queen, there are several queens of a smaller size which do not mate. Nevertheless, they lay eggs which develop into drones. The bees, as before mentioned, are small, build thirty-six cells to the square inch, and are not very industrious. For purposes of crossing they are very valuable. After several crossings with the black bees they will develop the finest Italians. In 1864 the first Egyptians were imported into Germany, and handed to the before-named Herr Vogel for experimenting. This race is to be found in Egypt, Arabia, Syria, and China.

CYPRIAN BEES.

"Cyprians over the whole world," writes a good German beemaster, and this praise is owing to their reputed excellent yield of honey. To describe this race: they are in size about

the same as the North Germans and Italians, appear to be somewhat more powerful, but build the same sized cells. Their colour is similar to the best Italians, and their breast is also of a yellow tinge; the hair on the breast, body, and segments is yellow and white. Their fertility is notorious, and their inclination to swarm exceeds even that of the Heath bee and Carniolean; their rage when stinging is not so great as that of the Italians, but they are more irritable than any other race. They are to be found in Southern France, Sicily, Caucasus, and the islands and capes of Asia Minor. The best coloured are those on the Island of Cyprus, from whence they were imported about fifteen years ago by Count Kolowrat (an enthusiastic amateur beekeeper in Bohemia and Austria,) and subsequently the race spread to Germany. I could not determine to breed them myself on account of their viciousness. At an Exhibition of the German General Beekeepers' Association several colonies were on view, and it was impossible for me to open a single hive without instantly having my face and hands full of stings. It is possible they may have become excited from the transport, but such was not the case with the Carniolean and Italians, about which hundreds of persons were standing and watching without being stung. No one dared to go near the Cyprians. The Syrian bees are a variety of Cyprians, and have the same peculiarities; in appearance they are similar to the Egyptians, and, if anything, exceed them in beauty. In my opinion the praise of the Cyprians is undoubtedly exaggerated. That they sting more than the Italian and German bees is admitted by their most ardent admirers. From my experience the Italians are the tamest, and are as handsome as the Cyprians. The Palestine or Holy Land bees are only another variety of Cyprians; they are as bad tempered as the Egyptians, but not so prettily marked; in size they are about the same as the Egyptians.

THE CAUCASIAN BEES

are also a variety of Cyprians. Those imported into Germany vary very much. Most of the queens produce unevenly marked and coloured bees. In my opinion this race has no great future before it, although they have been propagated by a good beemaster (Herr Datbé, jun., of Eistrup, Hanover.) Their gentleness is spoken of in laudatory terms, and it is said they can hardly be provoked to sting. Some colonies, however, sting as much as the Cyprian. This race was introduced to notice by the Russian Minister of State in Petersburg in 1880.

As I have now described nearly all known races and varieties of bees, I will classify them as follows, viz.:—Primitive races (*i.e.*, created by nature)—1, Northern German, or black bee; 2, Egyptian bee. Secondary races—1, Italian; 2, Cyprian; 3, Syrian. The secondary races have sprung up from voluntary crossings in ancient times of the primitive races. The Heath bee and Carnioleans are varieties of the Northern German, from which they can be distinguished only by a cultured eye. In conclusion, I cannot allow this opportunity to pass without alluding to Dr. Dzierzon and his introduction to the notice of the world of the Italian bee. It was reserved for Dr. Dzierzon, the veteran bee enthusiast, to raise the culture of bees to a science. As early as the year 1842 he introduced to the public the movable comb. On 14th February, 1853, he received the first colony of Italian bees from Mira, near Venice. Through experiments with these bees and close observation he noticed that the queen laid all the eggs, and that the drone eggs were also laid by her, but were not impregnated. Persons interested would not believe that a living being could develop from an unimpregnated egg. The worthy doctor, however, proved this. One of the greatest beemasters at that time, Baron von Berlepsch (the inventor of the movable bar frame,) in 1855 was the greatest opponent to this theory, but in a short time became the greatest advocate of the doctrine. Eminent men of science, such as Professors Siebold, Leuckardt, and others interested themselves in the enquiry, and they scientifically confirmed the doctor's discovery in every particular, not one iota being refuted. We owe our thanks to Dr. Dzierzon for introducing the Italian bee, and through whose keen powers of observation we have been enlightened in bee culture, and are enabled to develop the natural adaptations of the bee to the profitable industry of humane bee culture.

In a discussion which followed, Mr. Fiebig explained that the Italians were, in his opinion, a cross between the Egyptians and the black bees. He thought the Ligurians were best adapted for use in South Australia—the hybrids were too vicious. If left to promiscuous breeding, the bees will revert to the old black type, or perhaps the Egyptian, but the stinging power was not lost. It was pointed out that Langstroth was the inventor of the movable frame, but Dr. Dzierzon first used a simple bar at the top, to which the bees built their combs, and these had to be cut away from the sides of the hives. Several members expressed their appreciation of the useful information conveyed by the paper, and the meeting then separated.

ORIGINAL CONTRIBUTIONS.

*Management of Bees in Boxes.**(Continued from Page 20.)*

It is quite possible to cure foul brood even in a box hive by adopting Mr. Cheshire's plan of pouring medicated syrup over the combs. If any one would try it, the following plan may be recommended. Prepare some syrup made rather thin, one pound of sugar to the pint of water would do, put into each pint of such syrup 25 grains of pure phenol (pure carbolic acid in colourless crystals) and shake up thoroughly. Now smoke the bees slightly, turn up the box, and hold it so that the combs are inclined a little. If the medicated syrup is poured gently on the sides of the brood combs thus exposed, it will run slowly over the cells and much will drip into them, the rest will *trickle* among the bees, and be taken and stored by them for feeding the larvæ. Of course, some care will be necessary to avoid smothering a lot of bees, but if the hive is properly inclined and the syrup allowed to *trickle* down towards the top of the combs, over their whole breadth, it will be easy to dispose of a wineglass full on each of the combs tenanted by brood, without drowning or smothering a single bee. The nurse bees use this food for the young grubs, and it soon kills all disease germs, healthy bees are hatched, and the foul decayed brood becoming disinfected, and in a great measure deodorised, is soon cleared away by the bees, which seem to have new life instilled into them as healthy brood increases.

It will be necessary to repeat this operation several times, at intervals of a few days; in three weeks the stocks should regain something of their proper life and vigour. Some of the Continental beekeepers fumigate the diseased hives with the smoke of dried thyme, and it is stated that they have very good success by this method. In this way, *Thymol*, the essential principle of the thymè, does the same work in the shape of vapour, and no doubt *Thymol* would do as well as *phenol*, but the latter is the cheapest and most easily obtainable. Nevertheless, thyme fumigation is an easy process, and one Victorian apiarist assures me he has succeeded well with it.

Foul brood is a very contagious disease, and spreads from stock to stock very readily; perhaps by robber bees carrying the germs from one hive to another, or, as Mr. Cheshire suggests, bees from the infected hive carrying the disease germs sticking to the minute hairs of their feelers (antennæ) from flower to

flower, most probably leave some behind, which are accidentally picked up by bees from other hives, and so the disease spreads. It is very essential then, to keep bees from healthy hives away from combs, honey, or boxes of diseased stocks, and the following precautions should always be taken:—

After handling a diseased stock, or even its hive, touch no other stock till your hands are well washed. If you use gloves, use a special pair for diseased hives, and never by any chance use them in handling healthy ones, unless you disinfect them first by diluted carbolic acid. Never by any chance leave ever so small a piece of comb from a foul brood stock so that other bees can get at it. Everything that has belonged to a foul broody hive should be disinfected or destroyed directly the bees have been moved out. Before treating a stock with syrup, it would be well to move it away from other stocks if many bees are flying, as the odour of an upturned hive is almost sure to attract bees from neighbouring hives.

The signs of returning vigour as the disease gets checked, are, greater activity of the bees generally, healthy young bees appearing outside on warm days, and if the brood combs can be seen, it will be found that all the young grubs look a bright pearly white, and not the *pale stone-colour white* presented when they are getting diseased—all sealed cells have their covers standing well up above the surface of the combs, and the hive itself no longer giving off the faint sickly odour of rotting brood. This disease is even now much dreaded by apiarists, and no wonder, for before the modern methods of treatment were discovered, it was no uncommon thing to hear of 20, 50 or 100 stocks having been lost in one year. Dr. Dzierzon, in Germany, once lost 500 stocks by this disease, which he was powerless to arrest. But it may now be considered a controllable disease, but one that should be always watched for, especially when taking new stocks into your apiary, and promptly dealt with immediately the first signs appear.

We will now return to consider what had best be done in such a case as the first hive examined, and where the bees were found to be queenless. It has already been stated that a new queen should be introduced or the bees united to some thriving stock. The course to be followed must depend upon what resources the beekeeper has at his command. If he have a hive preparing for swarming, he would perhaps be able to cut out a mature queen cell and insert it into a comb of the queenless stock, or he may have a spare queen, or a weak stock with a laying queen. If he has a spare queen (one that has been laying) he can easily introduce it, but without some precautions

the bees might decline her presence and encase her and eventually kill her. To prevent this, it is usual to put the queen in a fine wire cage and stick this cage on to a central comb in the queenless hive. After twenty-four hours the bees will have got accustomed to her, and will feed her through the wires, and when let out she will generally be received with all signs of respect; if, however, they cluster around her, run over her, bite her, and behave disrespectfully, generally, cage her again for another twenty-four hours, when she will be almost sure to be well received. The bees should be well smoked when the cage is put in, and also when the queen is released. Smoking slightly with tobacco is a good course to adopt, and some experienced American apiarists smoke both bees and queen with tobacco, and let the queen run in at the door without any caging.

The cage is made of a piece of fine wire net, bent up about the size and shape of half an egg, with a tin rim soldered to make the edge even, and enable it to be forced into the comb to hold it in position. A wire net pipe-cover does very well, *if clean*. It should be fixed over cells filled with honey, so that the queen can get at food till the bees begin to feed her. But suppose no queen is available, but queen cells sealed up and looking well matured can be got from some of the hives, the proper course is to cut out a full-sized one, with about a square inch of comb attached, now being careful not to shake or squeeze or in any way bruise the cell, flatten out the comb *above the cell* with the finger and thumb, and if properly done this will enable you to *pin* the cell on to one of the central combs as high up between them as possible. Make a small pin or skewer from hard wood, and stick it through the flattened comb above the queen cell, and then on to the comb of the queenless hive, with the pin inclined in such a way that when the hive is put on its stand the cell will hang down in its natural position and will be safe from falling or coming off the pin. The bees will soon fasten it up and take care of it till the queen hatches.

If the beekeeper decides to unite his queenless stock to some other, the following course is recommended:—If the queenless hive and the one to which it is to be united are pretty close together, they may be united at once. Towards evening turn up the hive with the queen and sprinkle the combs and bees with thin syrup scented with essence of peppermint, then get a white cloth or sheet and place it in front of the hive; raise the hive and place one edge of the sheet under it, putting a small wedge or stone under each of the front corners so that there is plenty of room for the bees to crawl in. Now turn up the Queenless hive,

after smoking the bees, and sprinkle them with the same syrup. Give them a second smoking, and shake all the bees on to the sheet as close to the new hive as possible. They will soon hear the hum of the bees in the hive, and will commence to crawl up the sheet and enter. Being scented like the others they are not met as enemies, and are kindly received. If many bees stick among the combs of the Queenless hive, the heavy ones should be cut out and the *box well shaken*, when they can nearly all be jerked out on to the sheet and the uniting completed.

Poisonous Honey.

BY W. R. GUILFOYLE, F.L.S., DIRECTOR
MELBOURNE BOTANIC GARDENS.

Is there such a thing as poisonous honey in Australia? The only authenticated case I can call to mind of any person being poisoned by eating honey, is that of a boy who was supposed to have been poisoned by eating honey at a place called Burragorang, in N.S.W., about eighteen years ago, and even that case was not clearly substantiated. That the boy had eaten a quantity of honey, and that he died shortly afterwards, was not disputed, but whether the latter was in consequence of the former was not proved. And even granting that it were, it does not follow that the honey of which he had partaken was poisonous. It might have been that he had eaten it to excess, and had died of surfeit or gastric fever, as a King of England did of a surfeit of lampreys, and as persons have done before and since, of over-eating of the most innocuous things. Again, his death might have arisen from that idiosyncrasy in his constitution, which some medical men—Kirby and Spence to wit—inform us prevents some persons eating honey or even drinking *mead* without experiencing serious, and, it may be, fatal effects. The question is undoubtedly one of great importance, and one which really deserves careful consideration at the hands of apiculturists, first with a view to discover whether it is possible for poisonous honey to exist amongst us, and then, supposing it to be so, to find a means of determining which is sound and which is baneful honey, and if possible, to ascertain a preventive to its being made, or, at least, *an antidote to its ill effects* in the event of its being used.

It has been said, and I believe it to be quite true, that in certain parts of America the *Rhus Venenata*, or "Poison-Sumach," or "Poison-Elder," and other species of the order *Huacardiaceæ* (a family of plants which I have already grouped together in the gardens,) not unfrequently causes the death of whole

A. huacardiaceæ

swarms of bees through their merely alighting on their branches, and it is certainly true that few people can handle or even touch some of these plants with impunity, the hands and arms, and sometimes the whole body becoming swollen and very painful and inflamed. The Nerium Oleander, too, is known to be dangerously poisonous. Of this plant it is related by Dr. Lindley that a party of French soldiers at Madrid, in 1809, died through having used some branches of the shrub for spits and skewers for their meat when roasting, and he gives a well authenticated case of a child having died by eating some of the flowers. Then various genera of Ericaceæ are said to be injurious to honey; the Azalea ("A. Pontica, or Rhododendron Ponticum,") from whose flowers the bees of Pontus collected the honey that produced the extraordinary symptoms of poisoning described by Xenophon as having attacked the Greek soldiers in the famous retreat of the ten thousand, where the historian narrates that after eating it the men fell stupefied in all directions, so that the camp looked like a battle-field covered with corpses.

All of the Rhododendrons, Azaleas, Andromedas, Ericas, and others of the same order, may be looked upon with suspicion, as giving poisonous quality to honey. But none of these plants are indigenous to Australia, though they are quite common in our gardens everywhere. The place of the Ericaceæ is supplied by the "Epacrideæ," or Native Heaths, which are rich in honey, and which certainly do not possess any noxious properties; as may also be said of the numerous species of "Myrtaceous" trees—the "Eucalypti," "Melaleucas" and "Leptospermums;" and of the "Leguminosæ," such as our acacias, &c., &c., so much in favour with bees. No doubt many plants which grow in profusion in Australia are poisonous, but it becomes a question whether in a country like this, where wholesome trees and shrubs grow and flower all the year round, a wise and cautious insect like the bee would so far lose its natural instincts as not to avoid those flowers which are inimical to itself. Therefore, I come to the conclusion, although I do not state it as an absolute fact, that however much the honey of other countries may be impregnated with deleterious qualities from the poisonous nature of the plants of which they are the habitat, there is little danger in this colony, where our native flora is so barren of the genera which is confessedly the cause of the mischief, of our producing anything in the nature of poisonous honey. However, as I have already said, the subject is one which is deserving of the attention of, and close investigation by, all beekeepers, and of those who take an interest, whether for pleasure or profit, in the

delightful amusement or industry, as the case may be, of apiculture; and if my remarks on the subject have the effect of inducing them to more narrowly study the habits of "the busy bee," and the effect of "every opening flower" has on the "sweet food she makes," my object and aim will be amply served, and a question of no little moment to the sweet-toothed generation or the public at large set at rest.

Hints on Beekeeping.

BY W. ABRAM, MANAGER PARRAMATTA BEE FARM, N.S.W.

WHY AND WHEN DO BEES STING?

BEES use their sting only as a weapon of defence when they believe their home or their queen in danger, but in the field or garden amongst the flowers gathering their stores, they never sting, unless accidentally, if they get hurt or squeezed.

How far away from their homes they are likely to sting cannot be exactly stated, as it depends a good deal on the weather, the constitution of the colony, the treatment they receive, &c. I have known bees, when irritated, to sting people and animals thirty yards away; but, at ordinary times, they are not likely to sting over ten yards from the hive, and this generally occurs from the hive having been shaken, or perhaps turned over, or getting in the direction of their flight, also if you strike at them or make hasty movements in your operations. If one bee has stung, the others get angry through the smell of the poison, as they are very sensitive in this respect. They dislike dogs from their quick movements, horses from their strong smell, also the human breath, and some persons are more offensive to them than others. If your hat or clothing is hairy, or smells, if the weather is cold, and the bees at rest and you disturb them, or if it is very warm and close, if they are queenless or without brood, and yet strong, if the young queen is out for impregnation, &c., they are more likely to sting. Sometimes one hive in its normal state is more irritable than another, and even for a time will not succumb to smoke.

The effect of the sting is very different with different individuals. With most people there is considerable pain and swelling, while with others there does not seem to be any bad effect, which, I am happy to say, is the case with myself. It depends very much upon the blood, and although beginners may suffer a good deal at first, they soon get poison-proof, and stings affect them very slightly, or not at all; but be that as it may, I would not wish to

have bees that would not sting, as every mischievous or meddling boy would be disturbing them and pilfering their stores.

Remedies such as ammonia, tobacco juice, common salt, &c., are recommended, but, as a rule, the pain is over in a few minutes, and it is doubtful whether anything will prevent the swelling in some cases.

The best plan is to use a veil over the face when handling the bees, and to use a little smoke. It is surprising how quiet a puff of smoke will make the bees if used at the right time. Too much smoke of tobacco will make them worse, or stupefied and sick; tobacco smoke acts on the bees very much as wine does on human subjects. It requires experience to find out how much to give and when to use it. For non-smokers a fumigator is very useful, and old cotton rags or rotten wood may be used in this, but woollen materials should always be avoided, as the smell is most offensive to bees, and makes them worse than anything else. Any material that has a bad smell should never be used.

FEEDING BEES.

I never feed my bees, and did not intend referring to this subject; but as I have had many enquiries in regard to the best food, I certainly recommended pure honey in preference to any sugar or syrup, and the simplest way (if you have some honey in the comb) is to put a frame into those hives that require it, then no robbery will occur; but if comb-honey is not to be had, then feed with thin honey.

When feeding is required to make up the winter store, give to an ordinary strong hive two or three pounds of honey at a time, putting it in late in the evening, and taking away any that may be left early in the morning; but a strong colony should carry that much up in one night, if not too cool weather; then repeat the supply till sufficient store is provided. In spring, in the warm weather when feeding is required, it is advisable to mix one-third of water with the honey, as then the food is wanted for the young brood, giving half to one pound at a time, and repeat it three or four nights a week. This will make the bees increase rapidly, and strengthen them; the thin food should be covered with grass or straw to prevent the bees being drowned.

When honey, whether in comb or not, can be obtained it is by far the healthiest food for the bees, and quite as cheap as good sugar, and I am astonished to find how some bee keepers prefer sugar or syrup; it may be as good for the beeman, but certainly not for

the poor bees, as nothing can equal their natural food which they alone can gather; and a farmer might as well feed his cow on dry straw and water, and expect the same yield from her as if she were provided with good fresh clover or grass. In conclusion, I recommend leaving a sufficient supply of honey in the hive, and if this has not been done and feeding must be resorted to, give nothing but good honey.

DIARRHOEA.

After the above article on feeding it may be well to make a few remarks upon diarrhoea, which occurs usually in the winter and early spring, when the bees do not fly out, and consequently cannot get rid of their excrements, or occasionally when the weather is too bad for them to leave their hives, they then eat too much honey and often swell out as if they were drowned—they die either inside or outside the hive; but when the weather gets fine and they can get out every day the sickness soon disappears, and in a climate such as we have in Australia this disease should not occur, unless bad food has been given them, and they have been much disturbed during the winter.

CORRESPONDENCE.

(To the Editors of the Australian Beekeepers' Journal.)

GENTLEMEN,—I have to thank you for the copy of the initial number of your journal you kindly sent me, and to express my satisfaction at the evident progress you are making in apiculture, shown by the fact of your starting a journal devoted to the interests of the industry. You may enter me as a subscriber, and I wish you every success in your venture.

With your permission, I should like to make a few remarks on two or three subjects I see touched upon in the number to hand. I must first state that I did not receive the copy till the beginning of this month, and being so busy I have been unable to write earlier. In your report of the meeting of the Victorian Beekeepers' Club, and also in a letter from "Drone Comb," the question of adopting a standard frame for Victoria is discussed, a question of the greatest importance to the bee-keeping industry. There appears to be a divided opinion upon the matter, some advocating the Langstroth and others the British Standard frame. Without going over the ground I have so often gone before, that is, showing wherein the one frame is superior to the other, I may state that I have had

experience with different sized frames, varying from about the size of the British Standard, to others both larger and deeper than the Langstroth, but I find the latter to be the most convenient and best I have yet tried. I have now been using the Langstroth (ten frame) hive for the past seven years, and at the present time have 250 in use, and I have not the slightest wish to change. There are, moreover, two or three other beekeepers in this colony, of some considerable experience, who have had both the British Standard and Langstroth hives in use side by side, who have finally adopted the latter. Hives may of course be made to take any number of frames desired, but a ten frame hive appears to me to be as near the requirements for Australasia as possible, though if I were making any alteration I would have them to contain twelve frames instead of ten—the space inside can always be contracted by division boards to accommodate a small colony, or for wintering purposes if necessary. With regard to a central vertical bar to strengthen the frames, I have never found the need of them, and have never had one in use. If the frames are made of $\frac{3}{8}$ inch, well seasoned, straight grained, sound material, as they should be, there need not be any fear of sagging.

"Drone Comb" gives the best of reasons in the fourth paragraph of his letter why the Langstroth frame should be adopted as a standard, although he seems not to advocate it himself; but what he means by admitting "that the Langstroth *hive* is the best," and then wanting it "made to fit the British Standard frame," I am at a loss to understand. The principal features of the Langstroth hive, for which it has always stood pre-eminent, and upon which the Rev. Mr. Langstroth spent so much time and study in perfecting, are its particular dimensions; now alter these, and you no longer have the Langstroth hive. Knowing what I do of the Langstroth frame, as compared with other sizes, I would certainly advise the Victorian Beekeepers' Club to adopt it.

There is just one more item in "Drone Comb's" letter I wish to refer to, that is, the "metal ends" for spacing frames he mentions. My advice is, don't use it unless you wish to be put to a lot of bother, and are prepared to use "dummies" in your hives. Frames should have play to move laterally for convenience of removing them from the hive; now, if they have spacing pieces attached to them, a dummy or false side must be used, which has first to be removed to give room for moving the first frame, whereas the ordinary frames allow of being moved a little

either way, so as to give room to remove any of the central frames without trouble. The writer has had experience with spacing pieces, and desires to have no more.

If H. Naveau, when he is making nuclei, will place in the nucleus hives a good proportion of *emerging* brood and *close the entrances* to them to confine the bees for from forty-eight to seventy-two hours before he gives them their liberty, he will not have any trouble with chilled brood through the bees deserting the nuclei. The hives, of course, must be well ventilated, and be kept—while the bees are confined—in a cool, dark place

Trusting that these hints will be taken in the same spirit in which they are given, I am, &c.,

APIS.

27th January, 1886.

P.S.—We are having a very fair season throughout New Zealand, although we could do very well with rain. There will be a good quantity of honey raised here this season. I shall have close on or quite 10 tons from 200 hives—100 lbs. per hive, a very fair average. I am not in one of the best districts for honey either—some have done much better than that.

FOUL BROOD.

(To the Editor of the Australian Beekeepers' Journal.)

SIR,—Having been troubled a good deal by that dreaded pest, foul brood, it may not be uninteresting to some of your readers to relate my limited experience of it.

About fourteen months ago I bought several stocks of bees, in common boxes. These I transferred to bar-frame hives (British Standard.) For some time they did well, filling sections rapidly; one hive, No. 1, in particular doing remarkably well, it being much the strongest, until about the end of January, when the bees began to decrease in numbers, the sections filling much more slowly, although the hive next to it was doing as well as ever. I may here state that up to this time I had never seen a case of foul brood, although I had read a good deal about it. Matters went on this way until the end of the season, when the section trays were removed, disclosing a terrible state of things, the sheets of comb being literally rotten with foul brood, leaving scarcely any clean cells for breeding purposes. I removed and destroyed all the frames con-

taining the diseased comb, leaving the two outside frames, they being filled with sealed honey, and replaced with new frames and full sheets of foundation comb, which the bees soon worked out and rapidly filled with honey, and brood looking beautifully healthy, and I began to congratulate myself on having got rid of the disease very easily, but was not long in finding out my mistake, for, as the first batch of brood hatched out, there remained about one-third of the cells still closed, which, upon examination, proved the disease to be still at work in the hive. As it was getting late, I decided to leave them till the following season, and make a fresh start, and in September I removed the bees to a new Langstroth hive, with full sheets of foundation, the old hive being as badly diseased as ever, and the bees very weak, but not discouraged. They set to work again, and gradually increased in strength, and is now one of the strongest hives I have. By this time all the other hives, about sixteen, including one Ligurian and one hybrid stock, were badly diseased. They were all treated in the same way. Some of them being very weak were united, until the number was reduced to ten, all of which are now clean. Occasionally a diseased cell or two will appear, but I find very little trouble in keeping them healthy by applying to each affected cell, with a glass syringe, a small quantity of carbolic acid (Calvert's,) and spraying the combs with a spray producer and a mixture of warm syrup, with 1-400 of the acid, and also feeding with syrup 1-500—which I find the bees take freely when honey is not plentiful, but when it is they will not touch it in the feeders, but if poured out over the combs they gather it up readily; the absolute phenol (Calvert's No. 1,) used by Mr. Frank Cheshire, I have not been able to procure in Melbourne, so have been using carbolic acid by the same maker, which I am told is one and the same thing, and can be had, together with the syringe and spray producer, at any chemist's, the two latter at one shilling each.

All frames from diseased hives should be burnt up, and the hive thoroughly scoured with a strong solution of carbolic acid, or destroyed with the frames. Gloves, smoker, or other appliances, also, should be disinfected after manipulating a diseased stock before going to a clean one, as I am convinced, with my limited experience, that too much care cannot be taken to prevent the spread of this terrible scourge, for if once introduced into an apiary it is certain to spread through every stock, whether Italian, black or hybrid.

T. H. GRANT.

Kew.

NOTICES TO CORRESPONDENTS.

In reply to Mr. David Ratcliffe's letter in our third number, we may inform him:—That common White Box is one of the *Eucalyptus* tribe, its botanical name being "*Eucalyptus Leucoxylon*." It is considered a good honey producer.

Seeds of the American Basswood and Fig-wort can be obtained from Mr. J. M. Lloyd (see advertisement on last leaf) Dundas Place, South Melbourne. It is difficult to prevent bees building combs joining tops of frames to bottoms of section boxes. If the space is not more than a quarter of an inch, and the bottom of the section boxes or section box frames are slightly greased, very little trouble will be experienced. Some use perforated zinc honey boards and other contrivances. See reply to query 15.

NEW BOOKS, REVIEWS AND EXTRACTS FROM FOREIGN JOURNALS.

The Australasian Bee Manual, by Hopkins. We have been favoured with a perusal of an advance copy of this new Bee Manual, and have come to the conclusion that it is an excellent work, which fully meets a rapidly-growing requirement for a bee book adapted to Australasian conditions.

The Manual is an imposing and well-finished volume, about the size of Professor Cook's American Manual. The typography, engravings, paper and general get-up are highly creditable to the publishers, and, as regards the subject matter and arrangement, we have something more to say.

Of course it would be impossible now-a-days to write a book on bee management that did not contain much that is contained in other manuals, and we find a certain similarity and parallelism among all treatises on bee culture. In the *Australasian Manual* Mr. Hopkins has not hesitated to take the best from all the best bee books and magazines, fairly acknowledging the authors, and adapting and selecting to suit all the different conditions to which apiculture in Australasia must be subject, and which Mr. Hopkins' large experience in beekeeping in New Zealand enables him to do with considerable authority.

The Manual opens with a carefully-written chapter on the history of beekeeping, and of the introduction of bees into Australia and New Zealand from Europe and America; on the suitability of the climate and the flora of Australasia to beekeeping, &c. This is followed by a very interesting and exhaustive account of the different varieties of bees and their chief characteristics. For some years past many American and English apiculturists have devoted a good deal of attention to ascertaining the relative values of different varieties of bees and crosses between them as honey gatherers, breeders, &c., and Mr. Hopkins has given a summary of their experience in this direction, which will be valuable to beekeepers intending to try different races for themselves. The chapters on the apiary, hives, section boxes, extracting honey, comb foundation, manipulation, feeding, &c., are full, clear, and up to date in all the newest modes and contrivances. The chapters on transferring, swarming, dividing, &c., are excellent, and well repay the careful reader.

The article on queen rearing in chapter 12, describes Alley's method, which is probably now the *method*. This will be most valuable to the practical apiculturist, and is another evidence of the author's good judgment in giving the most advanced, yet well-proved, methods. The same remarks apply even more forcibly to *diseases of bees* in chapter 16, where Mr. Cheshire's mode of curing foul brood by feeding phenol, is given *extenso*, with engravings of the microscopic appearances of the juices of bees afflicted with this disease, alongside of the *new hive* method of Mr. Smith, the *starvation* method of Mr. Jones, of Canada, and Mr. Bonney's, of Adelaide modification of Smith's method, which will commend itself to all Australian beekeepers. The remaining chapters are all equally satisfactory, clear in style, and very practical. We have tried to find some faults in the Manual, but have not succeeded sufficiently to satisfy our critical mood. We have therefore the pleasant duty of recommending this Manual as the newest and best bee book of the Southern Hemisphere, and indeed we may even venture to say the best bee book extant. It should find its way to the hands of every beekeeper in Australia; its moderate price puts it within reach of the many, and possessing this Manual, a beekeeper in Australia will want no other. Mr. Hopkins is to be congratulated on the production of such an excellent, compendious, complete and practical book on Australasian Bee Culture, and we trust his venture may turn out as great a commercial success as it is a literary and scientific one.

NOTES AND NEWS.

Destroying Ants.—Although ants do not usually do much damage to strong stocks, they often become very annoying, and in some parts of Australia in dry season do certainly attack hives of bees. It will be always desirable, therefore, to destroy the nest of any found about an apiary. A very effectual method is to pour a little bi-sulphide of carbon (now largely used for suffocating rabbits) down each of the principal apertures of the nest, say about half a wineglass full in each. They seldom require a second dose, and the few ants which escape generally bring up the dead queens to the surface and decamp. Another effectual way is to sprinkle powdered corrosive sublimate (a very powerful poison) over the nests, and then water the surface slightly.

A Cheap Wax Extractor.—The following is a description of a wax extractor, which has been doing excellent service. A tin vessel, eight inches diameter and ten inches high, with a bottom made of wire net, ten or twelve meshes to the inch, has three legs each three inches long, soldered to the bottom rim. This is put inside a common large tin billy, or any other boiler large enough to receive it, and to leave a little space all around it. Water is put into the billy until it nearly reaches the wire bottom of the extractor, the leg of which keep it three inches above the bottom of the billy, which is put on a slow fire to boil. Now all old combs, fragments of wax, &c., can be dropped into the extractor, and the wax melts out very rapidly, and floats on the water, while the extractor retains all the refuse which must be from time to time emptied out; and so must the wax if there is much to render down. If the water with the wax on top be poured into a tub of cold water it can be melted up into blocks again ready for the final cleaning.

Beekeeping in Tasmania.—Although beekeeping in boxes is largely carried on in Tasmania, and the yields, as a rule, are very good, the modern frame hive method of bee management does not appear to have gained much ground in this beautiful island. It is with pleasure, therefore, we see from paragraphs in the *Hobart Mercury* that an apiary has been established at Glenorchy, near Hobart, at the orchards and hop grounds of the Messrs. Wright (called the Marrinook Apiary,) where forty stocks of Italians are already established. From a later paper we find that Mr. T. Lloyd Hood, of Hobart, was the first to introduce the Ligurian bee into Tasmania, and supplied the Marrinook Apiary with some twenty stocks. Mr. Hood had an

enormous increase by swarms this season, and his apiary being in Hobart, it was scarcely expected he would gather any surplus honey; but he states that from seven hives he has already gathered seventy 1lb. sections, and expects to make it up to one hundred by end of season.

Latest Swarms.—Mr. Dabb, of Braybrook, reports his last swarm on 24th January. A hive of Italians swarmed with us on 17th February. ED.

Beekeeping for Beginners.—To meet numerous requests from our subscribers, a series of articles on the first steps and principles of beekeeping will be commenced in our next number.

Crawling Bees.—Most beekeepers who have ever worked at their hives late in the evening or at night, and even sometimes while shaking bees out of a box for re-hiving in broad daylight, know what *crawling bees* are; and if they have profited by experience, will take care to tuck their trousers inside their boots, or at least tie up the bottoms, so as to prevent *crawlers* exploring up the legs. A bee-sting on any part of the surface not exposed to the sun and air is usually much more painful and lasting than those on the skin of the hands, face, or neck. After sundown, and in daylight when frightened or full of honey, bees crawl about on the ground a good deal, and take the first opportunity of crawling upwards; and if the beekeeper's legs are handy, they appear to prefer these objects for their ascent. Some time ago a Scotch friend of mine had a hive of bees sent to him from a distance; they arrived after sundown, and he at once set to work to uncover them and put them on their stand, which he accomplished safely, and rejoined some friends in the parlour. After about ten minutes he jumped wildly from his seat and appeared to execute a few steps of a Highland fling, with appropriate yells, when his wife, alarmed, exclaimed, "For God's sake, what ails ye, Willie?" "Eh, there's a dizen of thae beasts up my breeks, nepping ma legs like the vera deil!" He had omitted tucking the bottoms of his trousers into his boots, poor man. An American gentleman, looking at my bees one day, said, "I used to handle bees—my sister kept about 120 hives, and one summer I was home from college she offered to give me some lessons in bee management. The first lesson was watching her moving some bees from one hive to another, and I got my first four stings at that lesson. My second lesson was the next evening. Some bees she had put in a hive during the day were all swarming out at sundown,

and she wanted me to help her with a dustpan and goosewing in scooping them up and getting them back in the hive. They were crawling all over the place. 'Don't be afraid,' she says; 'it is too late for them to fly.' Well, I scooped away, and we got them all in; but before I got indoors I found a lot had got up inside my pants, and were sticking in their red-hot needles every movement I made. I rushed into my room and took off my pants, but not before nine had had their vengeance on me. I got so bad and swollen all over that I had to get a doctor. He only laughed at me, and told me not to fool around bees at night with my pants on! On enquiry why my sister was not a fellow-sufferer, she replied, 'Oh, I tied my pants around my ankles.'"

QUERIES AND REPLIES.

REPLIES TO QUERIES.

To No. 14.—If you have no "smoker," make up a roll of old dry rags of any kind, old sacks or bagging do very well; make it up like a sausage; by lighting one end of this it will smoulder and give out a lot of smoke, which can be blown by the mouth into the hive entrance, or down among the frames, or into common box hives. It is not difficult to improvise a smoker out of a tin canister, but as the bellows smokers are so much more effective and convenient, and by no means expensive, we advise every beekeeper to procure one. ED.

To No. 15.—Most beekeepers experience this difficulty, the chief cause of which is that too much space is left between the tops of the frames and the bottoms of the section boxes or section box frames. If the space is only just sufficient for bees to pass, say $\frac{1}{8}$ of an inch, or a quarter at most, there will be very little fixing down with combs. Greasing the bottom of the section frames with sweet fat is recommended by Mr. Coleman in his paper in No. 3 of the Journal. Perforated zinc honey boards prevent it also. In the bee books several arrangements of the section box frames or racks are recommended to avoid this difficulty, but if section box frames are used which only leave five-sixteenths between the tops of hive frames and bottom of section frames, and these are placed so as to *cover* or *break* the openings between the hive frames, very little fixing will take place. ED.

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NOTICE.

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THE
Australian Beekeepers'
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VOL. I.—No. 5.]

APRIL, 1886.

[PRICE 6D.

EDITORIAL NOTICES, &c.

THE Bee Season in the Southern parts of Australia may now be said to be over, and the bees are gradually falling into their Winter mode of work. Except in the south of New Zealand, or on the highest grounds in Tasmania, New South Wales, and Victoria, the rigours of an European or North American Winter are unknown, and there are not many days between Autumn and Spring in other parts of Australasia, upon which our friends cannot fly out for air, recreation, food and water; indeed, on most of our fine days in midwinter we find them returning with pollen, and often with a little honey too, from our Winter flowers. Breeding goes on in strong stocks all the Winter through, although on a small scale, and bees never have the enforced rest for many weeks which they are subject to in countries where snow and frost rufe for months together. Nevertheless, all wise beekeepers make a little preparation for the *quiet season* by *tucking up* their stocks in frame hives, by removing empty combs and closing up those containing brood and honey by means of a division board, putting a good mat, or even two, of "bagging" canvas over the frames, with provision for feeding if necessary; uniting weak or queenless colonies with stronger ones, and making all snug against rain and damp weather. Bees in boxes should be well protected from rain by sheets of galvanised iron, bark, or coverings of boards or palings. Boxes that admit rain or are damp through the Winter, always dwindle, and get very weak before Spring. Feeding should be certainly resorted to if honey is scarce in the hive, and all hives with light

combs should be fed regularly if strong Spring stocks are wanted, for although bees do get a little throughout our Winter, it is not enough to maintain a colony that started the Winter short of stores. At the same time care should be taken not to overfeed so that every cell is filled with food, for the rearing of brood would then probably cease altogether; and it must be remembered that if bees work in the Winter they don't live so long as when dormant and quiet, and as a consequence, a hive would soon become weak if brood rearing were to be suspended for several weeks, as might happen from cold, damp, or crowding the combs with food.

The news obtained from various parts of the colonies concerning the honey yield and increase in stocks is of a very varied character. In South Australia the season has not been by any means a good one, and indeed the early portion was almost disastrous; an immense number of colonies were actually starved through the prevailing drought. Matters improved after the beginning of the year, when the Eucalypts began to yield, but even that source was poorer than usual. In Western Victoria, also, there have been great losses and poor yields, although our friend Mr. Navean has had a very satisfactory Autumn harvest at Hamilton. Others have either had to feed their bees largely or have lost them by starvation or disease. In the country around about Melbourne success has been only moderate, while very fair yields are reported from more favoured districts, where clover lucerne and Eucalyptus have afforded ample forage for the bees. The best reports are from our wooded mountain sides and the moist forest lands of Gippsland, where beekeepers have done remarkably well. Reports

of a good season come to us from Tasmania, as well as from those portions of New South Wales that have not been much affected by the drought. In the Northern Island, New Zealand, Mr. Hopkins reports excellent and heavy yields, and from Southern Queensland such glowing accounts have come that it may be regarded as a "land flowing with honey," if not with milk also.

Increasing and successful bee culture in Australia will very shortly render the question of market and price for honey an important one. During the past season 1lb. sections have sold retail freely at 1s. 3d. to 1s. 6d. While extracted honey in small packages has commanded a price varying from 6d. to 9d. per lb., strained bush or box-hive honey in large parcels has realised 3d. to 4d. per lb. This difference will show our beekeepers the advantages of section-box honey and frame-hive honey for extracting, as compared with the common strained commodity. The strained honey selling at 3d. as gathered by the bees, was just the same as that selling for 1s. 6d. and 9d., but it was not presented in such an enticing form. Bell glass honey commands the highest price in Europe and America, and no doubt would do so here if carefully got up for the market.

Numerous and serious complaints of heavy losses among bees by disease have reached us during the season, and the whole question of bee disease is a very important one. "Foul brood" is unfortunately a more common disease among our hives in Australia than is generally admitted, and we are convinced that hundreds of stocks are lost from this disease, while the owner has attributed it to a "bad season" or "the moth." Then we have the diseases which, like foul brood, are attributed to the *bacillus germs*, such as the *shiny bee disease*, *trembling* or *swollen bee disease*, and a mixture of both, which has thinned out many a colony from beekeepers' stocks the last Summer, our knowledge of which is yet very limited, but which it appears, are manageable with some care and trouble, as has been shown in our pages. For combating the diseases of bees, it is necessary first of all that they should be understood, the true causes established and generally admitted; we shall then have some prospect of rational treatment. Unfortunately, however, every beekeeper has a theory of his own, and acts accordingly, and too frequently unsuccessfully. As foul brood is certainly, and probably other germ diseases in bees are, contagious, every beekeeper is in honour bound to use his best efforts and to seek the best knowledge to stamp out any disease in his apiary for his neighbours' sake as well as his own.

PROCEEDINGS OF BEEKEEPERS' SOCIETIES.

Victorian Beekeepers' Club.

AN ordinary meeting of the Club took place on the evening of 5th April, at the Manufacturers' Associations' Rooms, about twenty members being present, Mr. Ellery in the chair.

The following new members were elected, viz.:—Dr. H. Lindsay Miller, Warrnambool; Messrs. T. J. Loukes, Daylesford; W. Robinson, Warragul; G. W. Robinson, Berwick; Charles Moore, Wandin Yallock; Jos. Maggs, Ringwood.

Mr. Ellery read the following paper:—

"A SEASON'S EXPERIENCE WITH BEE DISEASE."

"Early last Spring, 24th September, a friend left a hive, with combs, at my residence, with a message that his bees, which he had got from New Zealand, had absconded from the hive, and that as I kept bees the hive might be useful to me. I found the hive in the garden, and some of my bees going in and out of the entrance. On opening the hive, the sickening odour was evidence enough of *foul brood*; combs were rotting with it, although there was plenty of honey, but not a single bee left except some of my own carrying off the honey. I at once stopped up the entrance, removed the hive, burnt the combs, frames, honey and all. I sulphured the hive thoroughly. On examining a fine stock of Italians in my garden about a month subsequently, I was annoyed but not surprised to find *foul brood* thoroughly established, not very bad, but three frames emitting the faint odour so characteristic of this disease. I at once took a new hive, with frames of foundation, and shaking the bees from the old frames into a box, let them crawl into the entrance of the new hive. I fed them with phenol syrup, three pints altogether in ten days. To-day (3rd April, 1886) the colony is strong, healthy, full of honey, and still increasing. Some of my stocks at the Observatory, about one-sixth of a mile distant, subsequently showed occasional cells of foul brood, and one weak stock was worse than the rest. This was treated by Cheshire's method, by feeding and pouring over combs; but although the foul brood was stayed, the queen ceased laying and the colony dwindled and eventually the queen died.

"Another stock, the strongest in my apiary (Italian,) contracted the *shiny bee disease* (or *Bacillus Gaytoni*), and with it, the form of disease, where the bees come out with swollen abdomens and die in a trembling condition on

the ground outside the hive; hundreds of bees were added to the heap of dead every morning, till the bees had diminished from a ten-comb stock filling sections, to barely three frames, which, on examination, showed cells of foul brood also. This colony was treated with phenol syrup in feeder and on combs; but they still decreased. The queen ceased to deposit eggs, and finally died. The remaining bees and combs were destroyed. Another stock, a nucleus in September, which increased very slowly, eventually became affected with the *swollen bee disease*—small heaps of dead being found just under the alighting board every morning. This case I fed carefully on phenol syrup, and this so far improved matters that the increasing brood outstripped the mortality, and the stock increased to seven frames. Then the *shiny bee disease* set in, and from that time the colony dwindled till only a few bees, with comb showing signs of foul brood, remained. These were destroyed by fire, the bees being first killed with chloroform. Three other strong stocks were also badly affected with the *shiny bee* and slightly with the *swollen bee disease*. The latter they quickly recovered from without treatment, but the *Bacillus Gaytoni* still remains with them in a diminished degree, and the colonies are thriving and storing their combs rapidly."

The Chairman called the attention of the members present to a new Bee Manual, by Mr. J. Hopkins, of Matamata Apiary, Auckland, New Zealand, which had just been published. He stated he had looked through the book most carefully, and had come to the conclusion it was the best manual for Australian beekeepers. It was written by one who had had a lengthened experience in apiculture in this part of the world, and it had special reference to beekeeping under the conditions existing in Australasia. He advised every beekeeper to obtain a copy of this new manual.

ORIGINAL CONTRIBUTIONS.

Beekeeping for Beginners.

INTRODUCTION.

THE following chapters are written with the view of meeting a widely expressed desire for some simple directions for the management of bees after modern methods, to assist beginners, and many others who desire to keep a few hives for recreation, amusement or profit. Should the reader possess that capital little sixpenny book on the subject, entitled "Modern Beekeeping: a Handbook for Cottagers," published by the British Beekeepers' Association, he will find but little

new here, as the following chapters are written on much the same lines as the book in question. Indeed, I have availed myself freely of the information it contains on many points. The articles on Beekeeping, by Mr. W. Abram, in the early numbers of the journal, will be found very useful, especially as regards the habits and natural history of the bee, and should be read by all beginners.

CHAP. I.—A COLONY OF BEES.

Bees, like some other insects, such as wasps, ants, &c., live only in large families or colonies. These colonies always consist of a mother (or queen,) and a large number—sometimes as many as 100,000 of worker bees, and, except in the Winter, of a greater or less number of drones, which are the male bees, and much larger than the worker. The queen is the head of the family, and in olden times, before the functions she performed were accurately known, was called the "king" of the colony of bees.

A full colony of bees, then, contains a queen, a number of drones (or male bees,) and an immensely larger number of worker bees, all of which are females, but sterile, that is, unable to perform the functions of a female, except sometimes partially, under special circumstances.

The natural habitation of the honey bee is in hollow trees, cavities in rocks or old buildings, the roofs of houses, or almost any hollow place protected from the weather; but they are easily domesticated and kept in boxes or hives.

The queen (or mother) is the very life of the colony, as without her a colony would soon dwindle away and perish. For bees are, as a rule, short lived. Under ordinary circumstances a queen bee becomes fertilised by the male bee before she is twelve days old, and, as a rule, commences to lay eggs before the twentieth day, and from these eggs bees are developed and emerge full-grown, twenty-one days after the eggs were laid if they are worker bees, and twenty-four days after if they are drones. If the colony and queen be healthy and strong, she will lay an immense number of eggs every day; in the warm weather often as many as two or three thousand daily.

The queen is of a somewhat different size and shape to other bees in a colony—she is longer in the body, and her wings appear shorter, because of her long and pointed abdomen. Her colour is often rather lighter than that of the others; this is particularly the case with some varieties of bees, such as Italians, Cyprians, &c. It is very desirable beginners should make themselves familiar with the appearance of the queen as compared

with the workers, and especially to practise finding her when moving about among her subjects. One who can readily find a queen in a good lot of bees, has made a great stride toward the art of beekeeping. The queen possesses a sting, and pretty strong jaws. She has never been known to use her sting when handled, and seems to reserve this weapon solely for stinging and destroying rival queens. She does, however, bite pretty freely, and beginners handling a queen not unfrequently let her escape under the impression she is stinging when she is only biting.

Worker bees also have stings, and use them freely on all enemies and intruders, and sometimes, I am sorry to say, on queen bees too. Workers attack strange bees which may enter their home, and sting them to death; they will also attack and sting a strange queen and kill her or maim her for life. A worker, in stinging, generally leaves its sting in the wound, because the sting is barbed. As the sting is torn from the body of the bee using it, it takes with it the poison bag and other portions of the abdomen, which, sooner or later, causes the death of the bee. But this fact does not deter these valiant little creatures using it without further ado if their home is disturbed or their stores taken from them. Still, it often appears as if they were aware of the penalty of stinging, for many a bee starts with the full intention of attacking, but thinks better of it afterwards, unless it is attacked in return. Drones have no stings, and are quite harmless. Each kind of bee in a colony has its special duties. The queen has simply to lay eggs to keep up the population of the colony, and she is fed and attended to in every way by the workers, and seldom leaves the hive. The workers bring in honey, pollen and water, cluster and keep the cells warm where eggs are deposited, feed the young larvæ when hatched from the egg, and then seal up and keep warm the cells in which they are until they have grown into young bees and eat their way out. They also hang in clusters and secrete wax for building the combs, act as scavengers and keep the hives clean, keep guard at the entrance to repel any intruders or bees from other hives intent on robbing. The drones do nothing but "loaf about" and eat up the stores gathered by the workers, and are of no use except when a new queen is reared, for securing her fertilisation.

How long do bees live? Queens live sometimes as long as five or six years; workers, in summer time, live only from six to eight weeks, but longer in winter—their length of life depending on the amount of work they do, and as they do less in winter than in

summer, they consequently live longer. It is not known how long drones live, as they are usually killed off or turned out to die by the workers after swarming is over; but when a colony has lost a queen, and under some other circumstances, the drones are not destroyed, and may live through a whole year or more.

The development from the egg to the full grown bee is as follows: Three days after the queen deposits the egg in the cell it hatches—that is, the shell bursts and a small white worm is seen instead of the egg. This is fed by the nurse bees; it rapidly gets larger and becomes a large, fat grub, almost filling the cell, when in five or six days the bees seal the cell over with a cap made of wax and pollen mixed. In twelve more days, twenty-one days in all, the now fully grown young bee eats its way through the cap, and although it does not leave the hive for outdoor work, becomes at once a useful member of the household, and assists in the nursing. The beginner should make himself familiar with the appearances of a comb in which breeding is going on, and first of all note the difference between cells intended for rearing drones and those for workers—those for drones being much the largest. If measured it will be found that there are five worker cells in a row of one inch long, and only four drone cells. To see the eggs before they are three days old, the comb should be held so that good strong daylight falls right into the cells, when a tiny oval white particle a little less in size than the egg of a blow fly will be seen attached to the bottom of many cells over some portion of the comb. If the eggs are over three days old they will have *hatched*, and the egg has developed into a larvæ, a small, worm-like grub, which a day or two later appears coiled at the bottom of the cell and swimming in a whitish, jelly-like fluid, which is the food given the larvæ by the worker bees. A piece of comb with eggs will also, as a rule, contain larvæ of all ages, those nearly old enough to be sealed over being fat, white grubs, filling the cell almost to the brim. When these are sealed down they are left to develop without further help from the bees, except so far as the warmth of the hive is concerned.

CHAP. II.—A HIVE OF BEES, AND HOW TO MANAGE THEM.

Assuming our "beginner" has obtained a hive of bees, and, from what has gone before, already knows something about the individuals composing the colony or stock, their duties, functions, &c., the first question will be how and where should he place the hive. This is an important point, and there are some lessons connected with it that must be learned at once. First—bees when first flying,

after removal of their hive to a new place, hover about a long time, and notice all the surroundings so as to mark the locality. When once they have done this they always come back to exactly the same spot; but if the hive be moved after it is once in position for a day, the bees go back to the old position and hover about till they get exhausted and die, unless the new position is not more than four or five feet distant from the first position. Again, if your hive of bees has come from any place within one and a-half or two miles, most of the bees on their first flight go back to their old home and either get into other hives or die about the place. So, if a "beginner" gets a hive or hives of bees to begin with, let him get them from some place at least two miles distant; and before he fixes them up at home let him decide where to place them once for all, and place them there before he allows them to fly. Precautions in moving bees from one place to another are necessary, and will be spoken of further on.

As to the best position for placing a hive and how to place it. Select a part of the grounds or garden where the bees can be well overlooked. It must not be too much shaded, for plenty of sunlight is desirable, but some shade from the hot Summer sun is necessary; it should not be too near the house, but should be sheltered as much as possible from the cold south and south-west winds. Beginners should place their hives on stands or benches standing not more than a foot from the ground and away from ditches, damp places, pools, or ponds. It is also very necessary that there be open space in front of the hives, to give room for bees to start their flight and swoop down on their alighting board when they come home without coming against any obstacle. No weeds or tall grass should be allowed to grow close around the hive. It does not much matter which way the entrance of the hive looks, but east or north-east is perhaps the best in Australia.

It is assumed that, as a rule, "beginners" get their first bees in a box hive, that is, an ordinary box of some kind, a gin or other spirit case, a candle or soap box, a jam case, or some of the many easily got boxes in which most cottagers and farmers keep their bees. This being so, he must see, when he places it on its new stand, that it is weather-tight; if not, he must put some cover over it to keep the rain out; a good board, a piece of zinc or galvanised iron with some weight on top will do this. If the bees have several entrances through cracks or knot holes, let them be carefully covered, so that they always enter at one place only. See, also, that the floor or bottom board, which he will have to

provide himself as a rule, is level, and allows the box to sit nice and flat on it, and stop any spaces around the edges of the box where bees may get in and out.

When bees in box hives are moved from their old locality to a new one, they are usually imprisoned by tacking or tying a piece of coarse open canvas or cheesecloth over the bottom or the whole of the hive at night after they are all home, so that "beginner" must remove this before the bees can get out. He will proceed as follows: Place the hive upon the floor board (which he has already prepared on his bench or stand) with the entrance directed the way he intends, then untack the canvas all around, leaving the entrance free, and if this is done in daylight (which is best) the bees will at once fly out, but being thoroughly frightened with their removal, will not attempt any attack or stinging. Now wait till they are all quiet in the evening, and gently lift the box off the floor board and draw the canvas from under it, replacing the hive without jar or shake. Next day, if fine, the bees will be all out playing about the hive, taking short flights and "bearings" of their new home.

(To be continued.)

CORRESPONDENCE.

(To the Editors of the Australian Beekeepers' Journal.)

GENTLEMEN,—In a recent issue of your Journal you asked for communications from subscribers. I venture to send you a little of my experience. I need hardly tell you I am quite a novice, starting last year with three gin cases as bee hives, which I bought at 12s. 6d. each; this year I have six Langstroth hives, and a gin case left from last year. I have taken three or four super boxes properly filled from one of mine. This I did at night without one sting. This fact made me a little gassey, and on a friend asking me to take the super boxes from his "Langstroth," I, with a friend, started at night to do this; but as the bees seemed to be in the super boxes in great force I counselled morning action, as I had read in the A.B.C. (Root's) that was the best time, consequently I and an old man started in the morning and removed the super box, putting on another. Then commenced the fun. The old man got several stings on his arms, and your humble servant a few on his arms and hands. As the boxes appeared to be full of bees, we thought it best to leave it till evening; but, to better allow the bees

to get out, it was decided to put the super box on a bollow box. The old man, who had done a great deal in his time with bees, was deputed to remove the box; this he did carefully, with about twenty bees fastened to him, singing out "I shall be stung to death!" The owner of the bees—who had been looking on—sings out, "Run in amongst the bushes!" at the same time commencing to run himself, having received an intimation that his presence was too close to his bees. The dog was next noticed to be in a great hurry to get away from the spot, two or three small sparks of hot iron having touched him. We then gave the job up till night, when every cell was found empty of honey, having been unsealed during the day—much to the disappointment of all concerned. I don't think myself a coward; but must admit the bees are rather too much for me, in this case at any rate. What did I do wrong?

22nd April, 1886.

W. J.

[Our correspondent, W. J., has certainly learnt a capital lesson in removing supers. Taking stores from a strong stock of bees is often attended with a little "excitement," but a little experience enables one to do all that is required without any "*red hot sparks*." Supers should not be removed at night, but in the middle of a fine day, when the large numbers of bees are away from the hive. Always give the bees some smoke, a few puffs in at the entrance first, and after about thirty seconds lift the hive cover and give a good cloud of smoke which will drive down a good many bees into the brood chamber. If the super is full, remove it bodily and cover it up at once (we always have a box which will shut close to put the supers in, for if carried exposed it attracts bees from all parts and induces fighting and wholesale stinging of the operators,) and take it away from the vicinity of the hive and place it in a room with a window or in a box that will close. If in a room, uncover the super, and the bees, after filling themselves, will all go to the window which, towards evening, should be opened, when all the bees will fly home, leaving your honey-boxes clear. If the super has been put in a box, it should be taken and put in the shade some distance from the hive, and after an hour or so the lid opened just enough for the bees to get out, and although some honey may be stolen, they will be all clear before evening. To prevent the bees carrying off the honey several contrivances have been invented, the object being to let the bees out and to prevent them getting in again. Shutting them up in the super in a room or box till towards evening

is best, as it leaves but little daylight for carrying back their stores.

The same course should be pursued if only a few section boxes are removed, which can be cleared at once with the smoker.

As super-frames and racks are often fastened down by the bees and require considerable force to separate them, a good deal of shaking and jarring of the hive is inevitable; a pretty free use of the smoker to begin with and during the operation is therefore desirable.

We advise W. J. to give up night-work with bees, as it is always bad for the bees themselves, and often for the operator too. Some apiculturists advocate after sunset as the time for many manipulations with bees, but we think that experience as well as the majority of beekeepers are against it.—ED.]

(To the Editors of the *Australian Beekeepers' Journal*.)

GENTLEMEN,—I am very much pleased, in the last number of the *Journal*, with the article written by Mr. Guilfoyle on poisonous honey. It interests me very much to read anything of the kind, having myself been reading a great deal on that subject, yet I have never been able to meet with one single instance where fatal results, supposed to have occurred from the use of honey, could be traced to the honey exclusively. There are places in the Southern States of America where "*Gelsemium sempervirens*" grows very luxuriantly; at the season when it flowers the honey may be injurious. But we have nothing of this to fear in Victoria; the very few poisonous plants cultivated by amateurs are counteracted by the immense amount of honey gathered from our *Eucalypti*. As the papers record instances where people have been poisoned with honey, the mind of the people is prepared to receive untruths for truth. One case came under my own observation very recently. A gentleman had purchased a hive of bees from me, and gave some of the sections of honeycomb to a friend. The latter, glad of his gift, ate some of it, and suddenly was taken ill and sent for the doctor, for he supposed he was poisoned with eating honey. As I was also consulted on the subject, I inquired how he ate the honey, and I learned that he devoured it (as a half-starved beggar would a morsel of bread,) honey, wax, and all.—I remain, yours, &c.

H. NAVEAU.

Hamilton, 30th April, 1886.

(To the Editor of the Beekeepers' Journal.)

SIR,—I fully agree with the suggestion submitted to the general body of beekeepers by friend A. E. Bonney, of Adelaide—"That a standard frame be adopted for Australasia; that said frame be the "Langstroth," as made by A. I. Root, of Medina, Ohio, and adopted by a large majority of the beekeepers of the two hemispheres." Of course I do not anticipate that all beekeepers will adopt that size; if the bulk do so it will be of considerable advantage; the losers will be those who do not.

There is no need to waste space by reiterating the numerous advantages that will attend the adoption of one exact size, they are well known.

I have read friend Abram's reasons for preferring the Berlepsch, or Dzierzon style of frame and hive. I am not yet convinced that it is better on the whole than the simplicity Langstroth, nor do I think his arguments conclusive. The fact that bees in a natural state are usually found in trees, where of necessity the height is greater than the width, is not conclusive to my mind, for frequently bees build in *caves*, or under shelves of rock, or, as I have seen them in Queensland, under the leaning stems of fallen trees; the combs exposed on all sides except the top.

I am not convinced that a hive opening at one end is better than one opening at top. With a simplicity hive I can and do work them to advantage, three and four stories high; this could not be done with the German. With the simplicity I have only to take one frame out and set aside, so as to work through the hive, which can then be done by simply sliding frames along into the space made; but with the German they must all come right out and be put aside. It is true I must lift the top story off to get at the bottom; but this is not much trouble, as I can lift it all off at once.

Then in working sections I think the simplicity superior, because of its simplicity and adaptability. I am not aware that the honey in upper story simplicity is tainted; if there is any danger of this, it is as easily rectified as in the German hive, by use of queen excluder-boards or zinc.

I have no trouble in getting combs built in the frame *all round*, and I am quite sure such frames of comb will travel and extract as well, if not better, than the tall frames not so completely filled. No doubt friend Abram prefers the style of hive he has become accustomed to use—ditto friend—and as his kind of hive has been used in all the Colonies and abandoned mostly, and as the

simplicity Langstroth is more generally used, here and elsewhere, except perhaps England and Germany, I think we cannot do better than make it the standard for Australasia until something considerably superior is presented to us—possibly further removed from friend Abram than we are at present. The new shallow, or half Langstroth, as introduced now by J. Heddon, and which is not altogether new, it having been in use (that is, a very shallow brood frame,) with good results for section honey for a good number of years by some American apiarists.—Yours,

CHAS. FULLWOOD.

Brisbane, 21st March, 1886.

NEW BOOKS, REVIEWS AND EXTRACTS FROM FOREIGN JOURNALS.

The New Bee Disease.—During last Autumn what the American apiarists term "a new disease" has made its appearance in that country. It is described in their bee journals as follows:—"About two thousand bees from one hive are badly afflicted. They are constantly cleaning themselves, by rubbing their bodies, legs, and wings. Their abdomens are shining, and the back portions intensely so. They are shrunken and pointed. The dead and dying bees are taken from the hive in a string or path extending six feet from the hive. The first indication was about a quart of dead bees. They have a fine queen, and have preserved their drones."

To this statement Professor Cook replies:—"This is just what I have often heard this fall. It seems to me a *new malady*. As yet I cannot suggest any cause, and so, of course, no remedy. Most beekeepers write to me that the affected bees seem young, and are black from being bald." The editor of the *Apiculturist* remarks:—"By the above it will be seen that there is no mistake about a *new bee disease*. The new malady is not contagious, and there is little cause for alarm. The worker bees may be seen crawling about the entrance of the hive and on the alighting board. The bees do not die off rapidly, but the colony gradually decreases in numbers, and the hive after a while becomes depopulated. The healthy bees continue to do the work of the hive, to gather pollen, and remove the dead and dying bees."

Referring to our bee lore we find the late Mr. Woodbury describing a disease from which his bees suffered in 1861-2, and which he designates "dropsy," in these terms:—"Symptoms: Great enlargement of abdomen,

which becomes so distended with watery fluid that the bee is unable to fly, in which state it betakes itself to the floor board, where in cold weather it dies, but in warm weather it wanders from the hive, and falling on the ground crawls about until it expires. All through the spring and during the finest summer weather, the ground in front of the hives was perpetually covered with disabled or dying bees, which crawled about in all directions with feeble vibration of their wings. In two instances the queens escaped, and their breeding powers seemed to be stimulated by the presence of the disease, since their fecundity not only overtook the mortality which constantly prevailed, but theirs became two of the strongest stocks in the apiary.

In another case of the malady the queen, swollen to an enormous degree, perished together with the colony. Eight years afterwards, another writer, referring to Mr. Woodbury's case, describes a similar attack amongst his own bees, and mentions in addition that the diseased bees had a "glistening appearance."

The only treatment found to be successful by these writers appears to have been the removal of the hive to a short distance, where the bees were shaken off the combs upon a sheet, each comb, as it was cleared of bees, being returned to an empty hive placed upon the original stand. By these means the healthy bees were able to return to their hive, but diseased ones—supposed to be chiefly young bees—perished on the ground, being unable to fly.

In the year 1884 we had a similar experience in our own apiary. An imported Italian queen, in her second year, and extremely prolific, led off a young swarm in the early part of July, the colony having previously filled two racks of sections, and being apparently in the healthiest possible condition. The swarm was placed in a frame hive, which by the end of the month, was well stored with comb and sealed honey, where brood was not deposited. But about the beginning of August symptoms of the above disease began to appear. The colony was working splendidly at the time upon a field of red clover adjoining the apiary, and pollen was daily carried in in large quantities, when numerous bees—to the number of 200 or 300 per day—unable to fly, were noticed crawling over the alighting board and covering the ground about the hive. The mortality continued to increase, and finally, about the first week in September, the colony with its queen perished. The combs were given to other colonies, and were productive of no ill effects. But mark the sequel. Early in February of the present year (1885) the parent colony, from which the swarm had

issued, located in a distant part of the apiary, headed by a young and most prolific daughter of the above-named queen, began to show signs of the same disease.

The hive was extremely populous—literally full of bees—and the mortality daily increased, although the queen continued breeding freely, and the healthy bees worked with redoubled ardour, until about the middle of March, when we found upon a close inspection of the hive, that the queen, although ovipositing, was affected by the disease, having lost her pubescence and assumed that glistening, "shiny" appearance spoken of above. By this time the bees had dwindled to such an extent that they barely covered two combs, and the best hive in our apiary, from which we had expected to reap the most bountiful harvest, had now become the worst.

"Heu! Quid facerem?"

"Quo fletu manes, qua numina voce moverem?"

Suddenly it occurred to us that *Bacillus depilis* (aut *Gaytoni*) was the author of all this mischief, and on reference to page 317 of our vol. xii. the suspicion became a certainty. Immediately we applied Mr. Cheshire's remedy of phenolated syrup, as recommended for foul-brood, having closed up division-boards, and removed outside combs. The syrup was freely taken, and soon we had the pleasure of inserting into the brood nest a frame of empty comb, then another, and another, until the colony attained its former prosperous condition, and the queen resumed her plumage, her bright glossy look and sprightliness, and the dread mortality gradually ceased. By the third week in May our colony received its first super; soon another was placed beneath it; and in due course fifty-six 1-lb sections were removed, and by the end of September about 30lbs. of extracted honey to boot, an abundance of winter store being left for the bee's consumption. The "new disease" of America, therefore, and the "drosy" of our venerated Woodbury, are surely none other than the *Bacillus depilis* of Mr. Cheshire. And in our case, at least, the disease apparently was transmitted from mother to daughter, and has been entirely eradicated by the phenol remedy, since the colony is now in perfect health, and up to the present time has exhibited no further symptoms of the malady. The disease, in our case, appeared chiefly to attack the young bees; but the brood, before emerging from the cells, seemed healthy. There was no unpleasant odour in the hive, and one decided and well-marked effect of the disease was the extreme irritability of the bees. No other hive in our apiary was attacked.—*British Bee Journal*, 1st December, 1885.

Introducing Queens.—In response to an inquiry on this subject I communicated to the *Bee-Keepers' Magazine* some ten or twelve years ago in substance the method here described. I had then been employing it successfully for some time and have ever since made use of it in introducing annually a large number of valuable queens—some seasons even several hundred, yet it has never failed with me, nor have I ever known of anyone's losing a queen in introducing (no matter at what time of the year) provided all the conditions herein named were exactly complied with. The method was re-published by *Gleanings* in 1883 at the request of a Texas correspondent who, with other beekeepers of his locality, had been invariably successful with it—had, in fact only lost queens when following the plan recommended by one of the most widely-circulated American text-books on beekeeping.

It is advisable to select always when about to introduce a valuable queen, a stock of bees which is in a perfectly normal condition and in prime order, that is, has a good laying queen, brood in all stages, honey, pollen and plenty of young bees. I remove the reigning queen and at once cage the imported queen in a pipe-cover cage,* being careful to put the latter over cells of honey near the centre of the cluster of bees so the queen will surely be kept warm and get food during her imprisonment. I usually put into the cage as companion-bees five or six just hatched workers taken from the hive to which the queen is to be introduced. The cage is pressed into the comb until the points reach the bases of the cells, and it is essential to place this comb in the hive in such a manner that the end of the cage will press against the adjoining comb, lest the bees by clustering on it pull it out by their own weight. On the following day just about sundown the queen is to be released, provided, upon opening the hive, the workers are not packed densely about the cage trying to sting her through it. In the latter case she may be left caged twenty-four or even forty-eight hours longer. But if left this length of time it is necessary to look for newly-formed queen-cells and destroy them before releasing the queen. It is best in all these manipulations to use a little smoke. Upon freeing the queen drizzle diluted honey or sweetened water over the combs and bees. The queen may also be daubed with honey at

the moment she leaves the cage. The combs are then to be replaced and the entrance of the hive contracted so but one or two bees can pass in or out at the same time. It will be well not to touch the hive for two or three days thereafter as the bees may attack the queen if the hive is open before they are thoroughly accustomed to her.

The conditions necessary to success in introducing queens are complied with by the above plan, namely:—The bees are queenless long enough to have become fully aware of the fact, yet not long enough to have started queen-cells; the strange queen is caged long enough to acquire the peculiar odour of the hive to which she is to be given; the bees are all at home when the queen is released, and thus all get thoroughly gorged with food and are well disposed toward the new queen. No robbers come about and by morning all is in order.—*From Frank Benton's "Bees," Munich.*

Carniolans—The bees of Carniola are noted for their great gentleness. They only rarely resent any manipulation, and need very little smoke to subjugate them. It might be thought they were lacking in pronounced qualities, but on the other hand, they show decided traits peculiar to themselves and accompanied by distinctive markings, and are therefore as justly entitled as any bees found in Europe to be called an established race.

The typical, select Carniolan queen has a deep copper or bronze-coloured abdomen, thorax thickly set with grey fuzz, large, strong wings, and a large stout-looking body. Carniolan queens are larger on the average than those of any other race, having especially broad abdomens. Some queens are quite dark, even attaining with age a shining jet colour. Such queens, though themselves resembling queens of the common race, do not produce bees in any way inferior to other Carniolan queens. Also pure Carniolan queens are occasionally met with which are as yellow as Italians. Yet they invariably produce workers and drones which are distinctively Carniolan. In all parts of Carniola some queens are found which produce bees having the first segment of the abdomen somewhat rusty red in colour, and they are as often seen among the finest, most prolific queens as among those of any other grade. Nevertheless, variation in colour and qualities is less with Carniolans in their native land than with Italians in Italy. Yellow workers are not found in Carniola, while black bees—natives, too, and not imported—exist in Italy. The remarkable size and general bronze colour of Carniolan queens, in contrast with the grayness of their progeny, make it easy to find them on the combs. They are exceedingly prolific, and herein lies one of the very valuable qualities of this race.

* DIRECTIONS FOR MAKING.—Use wire-cloth having 10 to 12 meshes to the inch. Cut a piece 2 in. wide by 4 in. long, roll it around a stick to give it a cylindrical form, lap the edges and sew with a piece of wire. Then in one end of this cylinder make slits $\frac{1}{4}$ in. apart and $\frac{1}{2}$ in. deep, and bend over the wire-cloth so as to close this end of the cage. With the flat end of a pencil press warm wax or comb into the bottom inside to give it firmness, then unravel five or six strands of the wire-cloth at the other end.

The drones are veritable "gray-coats," and stout, active fellows, having especially large wings.

Carniolan workers are silver-gray in colour, large bodied and strong winged. The thick fuzz of the abdomen is disposed in light-coloured bands, and as dark drab is the ground colour of the bee, the effect is a decidedly ringed appearance.

The following are the good qualities of the Carniolans:—1. The race is a prolific well-established one. 2. The workers are gentler than any other bees. 3. They submit more readily than other bees upon the application of a small amount of smoke. 4. They are excellent comb-builders and their sealed combs are of snowy whiteness. 5. They gather very little propolis. 6. Colonies in a normal condition are vigorous defenders of their hives. The workers are the largest bees of the species "*Apis mellifica*," and their individual strength is greater than that of other honey-bees. 7. Carniolans cluster very compactly and quietly, and winter remarkably well. 8. Queens, workers and drones are more beautiful than those of common bees.

Their faults are, so far as I know:—1. When made queenless they are thrown into great excitement and neglect at first to defend their hives well. 2. They are slightly more disposed during honey-dearth to rob than are Italians, though far less troublesome in this respect than blacks or Italians crossed with blacks.

Some might be disposed to bring up as a grave fault the disposition which Carniolans frequently show to cast numerous swarms. I believe this disposition in any race depends almost entirely upon the prolificness of the queens, in fact is, with all races, greater in proportion as the queens are prolific. Prolificness in queens is the beekeeper's corner stone. Swarming is Nature's escape for the surplus strength of the stock, and the beemaster has but to direct this force. Whoever cannot do this is not a master in the art. This, to some, seemingly "bad trait" is referable therefore to one of the most indispensable qualities—prolificness of queens, and is implied and properly included under the 7th point above.

It has been objected by people who claimed to have some knowledge of bee keeping, and even to know a good deal about foreign races, that "they could not tell Carniolans from common bees." Such persons will find there is still something for them to learn. Meanwhile, let an esteemed colleague give his testimony. Rev. A. E. Abbott says, in the "Busy Bee," St. Joseph, Mo.: "As to beauty, we think Carniolans the equal of any of the yellow races. A number of writers have said that they could not be told from the black

bees only by an expert. This is not true of the ones we have seen. There is very nearly as much difference between them and 'blacks' as there is between them and the Italians, and we think any child twelve years old would be made to see this as soon as its attention was called to it."

Even if this objection were sustainable, it could not be regarded as a very grave fault. Colour is quite a secondary matter as compared with qualities, and as regards the latter, I am quite satisfied Carniolans are superior to all other European races of bees.—*From Frank Benton's "Bees," Munich*

NOTES AND NEWS.

A Queensland Apiary.—A very interesting article, entitled "A Queensland Apiary," by the agricultural reporter of the *Queenslander*, appears in that paper of 8th May. The apiary referred to is that of Messrs. Spry Bros, on the Cooper's Plain-road, about four miles from Brisbane, and which has been named the Flowerdale Apiary. It is situated on a clearing of about ten acres of land, surrounded by heavily-wooded land, timbered by Eucalypts, Banksias, Acacias, Casuarinæ, and Melaleuca—a very paradise for bees. The writer speaks in glowing terms of the melliferous flora of the district, and directs attention to the immense sources of pollen in the Acacias and of honey in the Melaleucas or ti-trees, and also what a favourite with the bees is the long flowering stem of the grass tree ("*Xanthorea arborea*."). Such a flora as exists around the Flowerdale Apiary provides a perennial feeding-ground, and gives grand honey harvests to the apiarist. There are about 180 colonies, all in Langstroth hives, which are placed on the ground in regular lines, with about twelve feet between each line. The great aim of Messrs. Spry, so far, has been to make all colonies strong, rather than to increase their stocks. This is necessary, as they work for extracting only, and therefore tier up their hives in full stories, with full-size frames in the supers; each full frame giving about eight pounds of honey. There are workshops and extracting houses, which are described as patterns of order and neatness. All the hives are made on the spot, and all the honey made up in tins hermetically sealed. The bees kept appear to be chiefly Ligurian, and steps are in progress for introducing the finest breeds direct from Italy, as well as Cyprians. Mr. A. Spry visited Europe last year, and brought out some fine Ligurian and Cyprian queens, which arrived safely in the *Dorunda*, which, it will be remembered, was quarantined at

Peel Island for a long time, on account of some cases of cholera having occurred on board. The bees did not thrive in quarantine, and Mr. Spry lost many of his Ligurian queens, and thirteen out of fourteen Cyprians he had brought out; and more unfortunately still, the remaining Cyprian died afterwards, but not till some of her progeny were reared. This unfortunate termination to an expensive and spirited undertaking for the introduction of the best European varieties of bees, is stated to be due to an ignorant and foolish assertion by some writer in the local press, that if the bees were admitted without fumigation with sulphur (which, of course, meant destruction to bees) they might possibly spread the germs of cholera. To save what he could, Mr. Spry caught and caged the queens, and put them in his pocket, leaving the hives to their fate. The yield of honey in the Flowerdale Apiary last season was forty-seven tons from 160 colonies of bees, and this season, which has not been so good, twenty-three tons from 180 colonies is expected. The writer of the article in question remarks, in conclusion: "These facts show at a glance what a marvellous country for honey production Queensland will become."

Queen Bee sent from Munich to Victoria.—In "*Bees*," a small sheet on bee matters, issued in Munich, Bavaria, appears the following paragraph:—"Benton, sen., and Benton, jun., had a big time of it tossing up their old hats the other day over here in Germany, when a letter came, saying that the first queen sent by mail to Australia had arrived in fine order: only four dead workers out of thirty-five; queen, a Cyprian, laying three days after her arrival. The box was posted in Munich, 9th Oct., and received on the fortieth day thereafter at Hamilton, Australia, some distance inland from Melbourne."

The Best Bees.—In reply to a selected query in the *British Bee Journal*, as to which are the best bees for honey-producing, Mr. F. Lyon replies that he prefers the first cross between a Ligurian queen and a black drone, better than the pure Ligurians. Our own experience in Australia leads to the same conclusion. Mr. Lyon also remarks, that he has found small Ligurian queens produce better workers than the fine handsome ones. The most spiteful bees in his experience are the progeny of Black queen crossed with a Ligurian drone. Mr. Carr, in reply, states he considers the pure Ligurian the best honey gatherer. Mr. R. K. Godfrey says Blacks are as good as any, but the first cross of Ligurian queen and Black drone are excellent breeders, pleasant to manipulate, and capital workers. He also considers the cross between Ligurian

and Carniolan among those best worth cultivating as honey gatherers. Mr. A. Neighbour says, cross-bred bees are the best honey gatherers; a cross between English (Black,) Italian, and Carniolan would produce the best progeny. You then have hardiness, prolificness, and docility combined.

Mr. J. M. Hooker says Carniolans are the most gentle of all; pure Italians are handsome and gentle, *if quietly handled*, are good workers early and late. He finds them however delicate subject to spring dwindling and to loss of queens. He considers the dark leather coloured Italian queens the best bees he ever had. Blacks, he says, are best for supers and sections, and are the best comb-builders, and are also less liable to swarm.

Bees and Grapes.—The case of Randall and Noyes against Gustave Bohn, which was decided in Justice Knox's court in February, is probably without a parallel in the history of lawsuits. The plaintiffs are raisin-growers in the highlands, seven miles N.E. of this city, adjoining their vineyard the defendant has a bee ranch. The action was for damages which the plaintiffs claim to have suffered in consequence of the frequent visitations of the defendant's bees to their grapes. In support of their claim, they introduced numerous witnesses, who swore that they had, in various instances, witnessed with their own eyes the perforation and destruction of plaintiffs' grapes when alighted upon by the "busy bee" of the defendant. The latter, in turn, introduced evidence to show the impossibility of this condition of things. He proved, by a score of witnesses, that the bill of the insect is tubular and not pointed, and can, therefore, be used only as an extractor of sweets, not as a borer after them. The evidence of the eye-witnesses of the plaintiffs, however, had the weight with the jury, and they accordingly returned a verdict against the defendant for seventy-five dollars and costs of suit, which amount to over sixty dollars. The plaintiffs were represented by Curtis and Otis, and the Hon. H. M. Willis watched the interests of the defendant. This case is one of great interest to bee-ranchers and raisin-growers, and is attracting much attention.—"*San Bernardino Index*" (*California*.)

Cheap Book on Bees.—That most useful little book published for the British Beekeepers' Association, entitled *Modern Beekeeping: a Handbook for Cottagers*, costing 6d. or 7d. posted, can now be obtained from Mr. Mullen, bookseller, or by members of the Victorian Beekeepers' Club from the Secretary, on application.

Marks in Italian Bees.—From the *American Apiculturist* we gather that Mr. Bertrand,

who has lately visited many of the Italian apiaries, states that. "It is well known that all the bees of the Italian race have not got the three yellow bands of the abdomen equally well marked, and that he has substantiated this on several occasions. He further says that at Ornavano, Golasecca, and at Milan, are colonies showing only two bands. At the Sarton apiary in Milan, he saw, in 1881, drones as destitute of any yellow bands as any drones bred by our black bees. Out of Italy three yellow bands are considered an indispensable sign of purity, hence the reason why Italian breeders, while attaching no real value in work to the colour of the rings, endeavour to have no bees in their apiaries that will not show three bright yellow bands. The Italian queens which are in Australia are of two varieties—those whose queens are more or less wholly yellow or orange colour over the abdomen; and others which are blackish brown on the back, but dark orange colour on the under portion of the abdomen; and others, again, which appear in some degree ringed with orange and blackish brown, all of whose progeny show the three orange or yellow bands distinctly, but the progeny of the first or orange queens are certainly of a brighter colour than the progeny of the latter. It is stated that the bright yellow ones are the North Italian, or true Alpine bee, while the other variety is from Southern Italy. A cross between a Cyprian and South Italian bee produces a very bright yellow bee, and the queens also are bright orange.

It appears a difficult thing to decide what are the true characteristic markings and colour of pure Italians, and it now seems probable that the demand for yellow queens, and three yellowbands in the workers, has encouraged Italian apiarists to produce such a strain, by management, to meet this demand. The true Ligurian may therefore differ considerably from what we consider the pure strain. There is this consolation, however, that a first cross between what we know as Italians and our common black bee is better than either for hardiness, honey gathering and prolificness, and in many other points also. A great many Italian bees have now been established in Australia, but the majority of the young queens get crossed with blacks, and so gradually approach the latter variety unless they are reared in isolated localities or among a large preponderance of Ligurian drones. Bees taken from trees in Victoria very frequently show a trace, and sometimes a strong one, of the Italian blood. But all those obtained from Tasmania last season, show no sign of this, and those taken wild from trees have three distinct grey bands, somewhat like the Carniolans, but smaller.

QUERIES AND REPLIES.

QUERIES.

QUERY NO. 16. *a.* I have some trellis work: what creeper should I plant on it for the benefit of my bees?

b. I have about eighty feet of space along a fence: what would you advise me to plant there for my bees?

c. Is the pepper tree any use as a bee plant?
—*A. Perry.*

QUERY NO. 17—On the bottom board of my hive I find a lot of small white grubs, in the dust, dirt and fragments of wax which have collected there. What are these grubs, and do they do any harm?—*Drouin.*

REPLIES TO QUERIES.

To No. 16. *a.* Creepers that bear flowers which the bees like most are not always the best for a trellis. The Wistaria is a favourite, and blossoms early. All Nasturtiums are good. *Dolichos* blossoms nearly all the year round, and is often covered with bees. The potato plant creeper ("*Boussingaultia Basseloides*,") is spoken well of by some beekeepers; it is a hardy, fast-growing creeper, and looks well. The orange-flowered *Bignonia* is useful for bees in Autumn, and makes a handsome trellis plant.

b. This depends upon whether shrubs and trees, or merely herbaceous and annual plants, are wanted. If the latter, nothing is better than Borage, Horehound, Marjoram, common Thyme, &c. If shrubs and trees, Rock Rose, Veronicas, Callistemon (red bottle brush,) Loquat, Privet, (Orange or Lemon trees are all good; and if a hedge is required nothing is better than the African thorn ("*Lycium Horridum*,") as it blossoms for a long time, and is much liked by bees.

c. The pepper tree ("*Schinus Molle*,") when in blossom, is sometimes swarming with bees.

To No. 17—The white grubs are the larvæ of the wax moth, which has been in the hive and deposited eggs. These grubs may do a great deal of harm if they get in the combs, and do sometimes lead to the destruction or desertion of the colony. If it be a strong hive, they will probably be taken out by the bees before they do any harm; but at all events the bottom board should be swept clear of all rubbish of this kind, and the combs examined to see that no grubs are burrowing among the cells. Bottom boards of weak hives should be cleaned frequently, and no debris allowed to collect. Ed.

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VOL. I.—No. 6.]

MAY-JUNE, 1886.

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EDITORIAL NOTICES, &c.

USEFUL HINTS.

Feeding Stocks.—Those who want their stocks to be strong for the first honey flow from early spring flowers, must look after them now, and feed if short of stores. The best food now is honey or *thick syrup*—5 lbs. of sugar to the quart of water, with a teaspoonful of salt; if honey is used, scald it—unless you are quite sure it has come from healthy stocks,—for fear of introducing disease. As soon as ever the early wattles come into bloom, feed with thin syrup (3 lbs. to the quart) or honey thinned down with two parts of water to five or six of thick honey. If hives have plenty of honey, unseal some of it by scraping off cappings directly wattle blooms. By adopting these courses the queen is stimulated to early breeding, and the hives get filled with workers by the time honey-bearing spring flowers commence to yield.

Planting for Bees.—Although garden planting for bee food makes but little difference directly on the amount of honey collected in the season, it will, if judiciously carried out, make a considerable difference indirectly by stimulating the queen to early and regular laying, and the bees to greater activity, and giving them profitable amusement on wet or cold days, when they will not venture far from their hives. All beekeepers should therefore do something in the way of planting for their bees. Now, what are the best things to plant or sow for them? There are numerous bee plants which do well in England, and in parts of Europe, and in the United States, but concerning which we have as yet had no experience in Australia, although the *mints*

and *sages*, such as Catnip and the White Sage of California, are certainly successful. We don't know so much of the Cleomes (Spider Plants,) Basswood, &c. But there are quite sufficient plants about which we have experience in Australian climates, and which furnish pollen or honey in plenty, that can be safely recommended for garden planting. For kitchen garden, nothing beats broad beans and peas, or the flower of the turnip, cabbage and mustard for early supplies, and it is worth while to plant a crop of the latter now, to blossom early in spring. Borage grows well in this climate, and should be sown any time before September, the earlier the better: it is a capital honey plant. All garden herbs, more especially common thyme, savory, marjoram and sage, are great favourites. Fennel and aniseed are also excellent. In the flower garden the early bee flowers are wallflower, cornflower, or *corn cockle* (splendid bee plant in this climate,) the early lilaceous plants, such as jonquils, crocus, hyacinths, &c. "Phacelia" blossoms early too, and is usually covered with bees. Later on the sweet mignonette becomes a favourite; but there is a scentless variety called the mammoth or giant mignonette which is very hardy and grows like a shrub, with long spikes of flowers, is most highly spoken of; and no flowers are greater favourites than golden rod and vipers bugloss ("Echium Candicans.") For summer and autumn sunflowers, asters, hollyhocks, the tree mallow, and any of the clover tribe are the most useful. If the season is favourable, successions of cornflower should be sown. There are some plants being sold in England in large quantities for the flower garden for bees—the "Linmanthis Douglassii," or Californian Lake flower, and the

wall cress, or "*Arabis Alpinus*." The value of these in this climate will be tested in spring. The best flowering shrubs for bees are the rock roses, veronicas, lilacs, callistemons, polygalas, currant, gooseberry, and raspberry bushes, the black flowered pittosporum and the African box thorn. Among what we call weeds the bees find welcome and often liberal supplies, especially in the Cape weed, flat-weed, dandelion, nettles, and sorrel. Horehound and the clovers should be scattered about along fences and in any waste corners or places.

The Langstroth Hive and Frames.—While there seems but little doubt that the Australian hive will be the ten-framed Langstroth, there is fear lest some trivial variation in the dimensions of frames or boxes may be adopted, which will as completely defeat the great objects to be secured by uniformity as the introduction of hives of other forms and sizes. During the last season we had occasion to move frames of brood from a Langstroth hive (so called) to a Langstroth of the dimensions given in the books and exactly similar to the simplicity Langstroth—but nearly a quarter of an inch had to be cut off each shoulder of the frame. The New Zealand pattern Langstroth has the shoulders of the frames so short that they slip off the runners of a simplicity hive.

Now, if the full benefit of uniformity is to be obtained, exact dimensions must be agreed upon and *stuck to*. The inside measure of a Langstroth hive is $18\frac{1}{2}$ inches long by $14\frac{1}{4}$ inches wide, and 10 inches high; the rabbet for the frame ends is $\frac{3}{4}$ of an inch deep (measuring from the top towards the bottom of the box) and $\frac{3}{8}$ of an inch wide (taken out of the thickness of the wood.) The frames themselves should be of the following dimensions: $17\frac{5}{8}$ inches long by $9\frac{1}{4}$ inches deep, outside measurement, the top bar being $19\frac{1}{2}$ inches, which gives shoulders $\frac{3}{4}$ of an inch long. The British Beekeepers' Association has adopted a rigid standard measurement which all makers strictly adhere to, and if anyone ventured on a variation of an eighth of an inch in any of the parts, he would soon get into trouble, for nothing can be more annoying to the beekeeper than to find during his operations that frames from some hives are too small or too large for others.

Frame Spacing. — English beekeepers strongly advocate appliances for spacing the frames, and while admitting that American apiarists do not use any, and even condemn them, use them very generally and largely, and speak highly of the advantages of doing so. Some of our Australian beekeepers consider them worse than useless, and speak

against their use; but it will be worth while to refer to the arguments both for and against. Experienced beekeepers, handling perhaps hundreds of frames daily, will replace them rapidly, spacing them correctly with their finger-tips, almost instinctively. If one frame is wrong, however, all the rest must be moved a little in order to set it right; although a slight variation of space is of not much consequence. It often happens also that in a full hive, a little extra space is required to lift out or replace a frame of comb and bees, and this can be readily done by moving all the frames a little closer together than the standard space for a time. If spacing contrivances are used, the frames *cannot* be got closer together than the standard distance, nor bees squeezed or crushed (which they certainly may be by crowding frames together without the spacers.) By pushing the outside frame home against all the others they are immediately spaced without setting each individual frame right. The objection that extra space to lift out or replace a "spaced" frame cannot be got without using a "dummy," or division board, is a real one; but an equal, if not greater objection, lies against crushing combs full of bees against one another, at the risk at least of angering the bees, if not of killing some. We have been against "spacers" because of this objection, and perhaps more because "experts" have spoken against them as unnecessary, and as mere aids to novices. After handling some full British standard frames with metal spacing ends on the frames the last season, we altered our opinion. The facility and rapidity with which one can replace and push the frames into their places without fear of crushing, the nice gliding smooth motion of the leaden metal ends on the runners, and the even and regular way the combs are built in consequence of the absolutely correct spacing of the frames, we consider are points greatly in their favour. They are, however, certainly *extra pieces* in the hive, and add slightly to the cost, and the beekeeper, who counts his stocks by hundreds, and works hard for honey-returns, is not likely at present to adopt them. To those, however, who keep a few stocks only, and like to have things nice, the advantages the use of them affords will amply repay the slight extra cost and trouble in putting them on the frames.

Cure for Stings.—In the May number of the *Garden and Field*, it is stated that the juice from a young frond of the common bracken fern "*Pteris Aquilina*" if rubbed on to the skin where stung by a bulldog ant, at once allays the pain, and suggests it may be equally efficacious with bee stings. It is easily tried.

PROCEEDINGS OF BEEKEEPERS' SOCIETIES, &c.

South Australian Beekeepers' Association.

QUEEN-REARING.

At the meeting on 1st April, Mr R. Fiebig, jun, read a paper upon "Artificial Increase of Bees," of which the following is a full abstract:—"The natural method of increasing colonies of bees is by swarming, but the apiarist who allows this is dependent upon the will of his bees. If bees have sufficient room in the hive for storage of honey, &c., they are less inclined for swarming. The beginner who has not got the number of colonies he desires to keep may safely double his stock by division, or artificial propagation, but he must be acquainted with the habits of bees, else he may suffer loss and disadvantage. Dividing should only be resorted to when the colony is strong enough; when it could afford a natural swarming without disadvantage, and when the brood chamber (or central combs) are well filled with brood. Dividing may be classified thus:—1. Dividing the bees only; and 2. Dividing the bees and combs. The most suitable time is between 10 a.m. and noon, because then most of the old bees are away from the hive and do not molest the operator. I will describe four methods of making artificial swarms which by experience I have found best.

"No. 1. The hive which is to be divided—I will call it the parent hive—is left on its former place, and the empty hive put alongside of it. Now a brood comb is taken out of the parent hive, containing mostly unsealed brood, and one comb with honey, with all the adhering bees, and put in the empty hive. Comb after comb has to be taken out of the parent hive, and the bees are brushed off with a feather into the new hive. If the queen is found on a comb with unsealed brood, this frame may (as this is the safest way, especially for a beginner) be put in the new hive. Unfortunately the queen may be on a comb with sealed and nearly-hatching brood. It would in this case be wrong to take the frame and put it in the new hive, as by so doing the parent hive would lose a great number of young bees. The queen must in this case be induced to run on the combs in the new hive. The remaining space of the new hive is filled up with frames, fixed with starters of comb foundation. The cleared-off combs from the parent hive are put back to their former places. The artificial swarm is now ready to take its new place, which should be some distance from the parent hive. All the old bees will return to their old home, and as all the sealed brood

is left there—consequently a great number of young bees hatch every day—the parent hive will in a short time have reached its former population. If a young fertile queen is at hand she may be inserted in a cage to the parent hive and set at liberty twenty-four hours after (provided the old queen has been put in the new hive.) By doing so the swarm in a few days is in perfect working order, whilst if they had to rear a queen it would be weakened very much. The new colony must be provided with plenty of honey, because all the bees are young ones, and these cannot gather any honey for the first few days. Young bees do not gather honey—even at the peril of starvation—before they are sixteen to eighteen days old.

"No. 2. This method differs from the first in the time of performing the operation. It must be done when most of the bees are at home. The combs of the parent hive are divided in two equal parts with all the adhering bees, so that each part has equal numbers of frames with open and sealed brood and honey. The artificial swarm must have the old fertile queen, and be removed to a place beyond one mile from their former standing-place, because if left here the old bees would fly back to the parent hive, and thus weaken the new colony. A young fertile queen or sealed queen cell may be given to the parent hive.

"No. 3. This method of making artificial swarms is only practicable if the apiarist has already a large number of hives. A brood comb is taken out of a strong colony, the bees brushed off, and a young fertile queen caged on it. This comb is put in the middle of the empty hive. From each of six or seven of the strongest colonies one brood comb containing honey, with all the adhering bees, is taken out and put in the new hive. Care must be taken not to put any other queen into the hive. To prevent the bees from fighting with each other a little smoke is used. Then the swarm is provided with a vessel of pure water inside of the hive, and kept in a cellar or any other dark and cool room for not less than three days in order to unite the bees properly. The fourth or fifth day the artificial swarm may be placed on its stand in the apiary, and the queen liberated.

"No. 4. The brood comb on which the queen is found in a strong colony is taken out of the hive and put with the adhering bees in the middle of an empty one. The remaining space is filled up with frames fixed with starters of comb foundation. This new hive is put in the place of the parent hive, and the latter in any other place in the apiary. But this must be done when the most bees are out of the hive. The consequence of changing the hives is that all the old bees, who know their former

standing place exactly, will unite with their old queen, and thus form a new swarm similar to a natural one. A young fertile queen or sealed queen cell may be given to the parent hive. All this shows how profitable it is to rear some queens before artificial increase is started. An artificial swarm, if properly made, is just as good as a natural one, and very often excels it in honey-producing."

DISCUSSION.

Mr. A. E. Bonney had never increased his stocks by natural swarming, but had almost invariably used the nucleus system. During the past season from four hives he had increased to about 25 full colonies, 12 nucleus hives, and 50 nucleus boxes. His plan was called the nucleus system, and was as follows: Take a comb of hatching brood—bees, queen, and all—from a strong colony, and hang this comb in an empty hive with a comb of honey on each side; close this hive with a screen and keep it closed for three days. The gaps in the strong colony should be filled with frames of foundation. The nucleus hive can soon be strengthened by adding combs of hatching brood.

Mr. Fiebig stated that by dividing a colony and giving a queen, within three days the colony would gain in number at once, whilst by leaving the hive without a queen, the colony would decrease continually for three weeks, until the new queen was hatched and began to lay. The loss during the 18 days would be of the natural increase of about 2000 per day by the queen, and by the deaths.

In answer to a question as to whether it is advisable to divide strong colonies at the present time, it was considered to be worth while to increase the colonies by nuclei, but not to weaken strong colonies by dividing now, the reason for this advice being that there are indications in many localities that the honey harvest will last all through the winter.

In answer to other questions, several members stated that they had seen foul brood in their hives, but had overcome it by burning all the old combs, cleaning the hives with phenol and carbolic acid, and giving them clean comb foundation. The strength of salicylic acid used by one for washing the hives, &c., was one part of 75 parts of water. The same strength of salicylic acid (dissolved in alcohol) was used for mixing with the feed—one in 200 is strong enough. Simply transferring on to clean comb foundation without feeding was frequently successful.

Mr. Bonney mentioned that most of the old box hives amongst the hills have foul brood this year. It was very serious, and it was necessary first to destroy all comb and all brood, saving the mature bees and queen, and giving new frames with full sheets of foundation,

after boiling the old hives in a solution of carbolic acid in the proportion of one to 200.

It was mentioned that Messrs. Coleman and May had been curing foul brood by fuming sixteen grains of salicylic acid at the entrance of each hive, using a spirit-lamp and a special contrivance. Some of the members, however, had failed to cure the disease by this method.

At the meeting of the Beekeepers' Society on 4th March, Mr. A. E. Bonney read a paper upon "Queen Rearing," of which the following abstract gives the whole gist:—

Queen rearing is the highest branch of apiculture, and should only be undertaken by those who have acquired a thorough and practical knowledge of bees and beekeeping. It is also the most interesting and instructive. The importance of having a good queen in each colony of bees is well known by experienced beekeepers. A strong healthy colony of bees in this favoured country will give a good account of itself, no matter what description of hive it may be in. Now, in order to get this strong colony a young prolific queen is indispensable. In a recent number of an American bee journal the question was asked, how to rear the best queens? The reply was, "Get Alley's book," which I think was about the best answer that could be given. His system is far in advance of any other with which I am acquainted. I have brought in a complete outfit of the necessary appliances for rearing queen bees according to Alley's system, and by their aid will endeavour to explain the system. All these appliances are of simple construction, but require to be accurately and well made. The little nucleus boxes have to be exposed to the extreme heat of summer, and it is therefore essential that they are made of wood at least seven-eighths of an inch thick. Two or three persons who have tried these miniature hives complain that the bees will not stay in them. I have had no trouble in this way. By keeping them supplied at all times with uncapped brood and abundance of honey or sugar syrup, they will not show any inclination to leave. Since the gumtrees have come into bloom near my apiary, several of these little colonies have become too crowded, and have sent out natural swarms. Many persons advocate getting queens by natural swarming as the best plan, but one serious objection to this is that by so doing we encourage the swarming propensity of our bees. Excessive swarming has ruined many an apiary in South Australia, and the efforts of all queen breeders should be directed towards modifying this objectionable propensity as much as possible. In selecting a queen to breed from, choose one that keeps her hive full of quiet, hard-working bees,

which do not show any disposition to swarm without a cause. If the bees are Italians, they should be handsome and evenly marked; but the chief points to breed for are gentleness and honey gathering. As to which are the best bees for us, experience has shown that the Italians are much superior to the blacks, and that hybrid—the first cross—are excellent honey gatherers.

The extreme heat of a South Australian summer has a considerable effect upon the development of queens when in the larval state, and greatly accelerates it. This I know to my sorrow, having in years past lost several lots of queens through one emerging a day before she was due. Most authorities give sixteen days as the time from the egg to the perfect queen, but in this climate fifteen days are nearer the mark in ordinary summer weather, and fourteen and a-half days during extreme heat. I would never leave the cells more than seven days after they are sealed. If it is necessary to feed bees when they are building queen cells, I use only good extracted honey, and am very careful that the feeder is kept clean. On no account should any salicylic acid and borax be administered with the food, or the queens will be ruined. It appears to arrest the development of the wings and prevents the queens from biting out of the cell. If you are afraid of foul brood, and wish to give some antiseptic, use very sparingly salicylic acid dissolved in alcohol. By the aid of modern methods and appliances the beekeeper can rear queens in any number and at almost any time, but unfortunately he cannot control their mating. Many reports have been published from persons who stated that they had succeeded in getting queens fertilised in confinement; but these reports have never received any credence. By the use of drone-traps, a queen breeder can prevent all objectionable drones from flying in his own apiary; but my experience shows that this is of no avail. Mr. Alley states that half a mile is sufficient distance to keep the different races of bees apart to ensure purity, but he is evidently in error, and I am glad to note in the third edition of his book that he justifies this statement by adding that his fertilising apiaries are several miles apart. Two years ago Mr. Justice Boucaut had the only colony of Italian bees in the neighbourhood of Mount Barker, and yet one of his drones mated with a black queen in Mr. Coleman's apiary, four miles away. The early part of this summer proved most disastrous to black bees. There was so little honey to be gathered that drones were quickly killed off, and I anticipated no difficulty with my queens; but in this I was disappointed, and in spite of the numbers of Italian drones in my hives, at least half the queens mated. There is only one

certain plan to adopt, and that is to take our queen down to Kangaroo Island, where Italian bees alone are kept. This island has lately by Act of Parliament been set apart for this superior race of bees. The Chamber of Manufactures, in order to make sure that there are no black bees on the island, issued circulars to the residents asking for information on the subject. The evidence is most conclusive that there are no other than Italian bees there. Mr. Fiebig, who has this season sent a number of young queens to Queenscliff, and brought them back as soon as they were laying, has had most pleasing results, and is highly satisfied with the plan. In this connection I will give an extract from a letter received from Mr. T. C. Root, one of the ablest apiarists in America. He says—"If you are successful in passing the Bill (*i.e.*, the Ligurian Bee Bill,) and keep only Italian bees, the world will yet come to you for Italians. I would ask no greater privilege than to be able to keep the Italian bee where I could control its purity to a certainty; I would build up a strain not to be surpassed." I am confident that there is a good opening for any one to go and settle in Kangaroo Island and rear Italian queens. Of course he would require to be a skilled beekeeper, and would have to take with him a complete outfit for queen rearing, besides one or two of the best queens obtainable. I will once more impress on you the importance of getting good prolific queens, and point out that in order to do this you must use no other than full colonies of bees for cell building. It is not so much the difference in appearance of queens raised in small boxes and in large hives, as in their future usefulness. Whilst one queen will perhaps give out after two seasons' eggs laying, the other will prove vigorous and prolific for three or four years. To all breeders who are also dealers in queens, I would say, adopt Mr. Alley's motto of "Better, not cheaper, queens."

Victorian Beekeepers' Club.

THE monthly meeting of the Club was held at the Exchange, Melbourne, on 10th May, at 8 p.m., Mr. Ellery being in the chair.

THE BEES OF INDIA.

Mr. F. B. Miller introduced Mr. Nicholson, from India, who had had considerable experience with the bees of India and of the introduction of the Italian variety into that country.

Mr. Nicholson then gave an interesting account of his experience with the varieties of bees indigenous to India. He stated that there are three kinds of bees, a large one nearly an inch long, the *Apis Dorsata*,

another, somewhat smaller than the ordinary black bee, and a still smaller one, not larger than the common house fly. He had been commissioned by the Government of Madras to try if it were possible to domesticate either of these races of bees. He had found the intermediate kind would work in a hive, but as they only stored about ten pounds of honey during the season, they were not considered worth keeping. The large bee, *Apis Dorsata*, he stated, builds only one comb, and usually under rocks or cliffs, hence its common name Rock Bee. This bee he described as being very wild, building combs which often measure three feet or more in length, and have a thickness of eight inches at the top where they store the honey which, as a rule, is not worth collecting, excepting about once in seven years, when it is good. As many as 130 swarms have been known to build under one cliff. The natives collect the combs by mounting on bamboo ladders with torches of flaming grass, with which they both smoke and burn the bees, when they detach the large combs and their contents into large baskets. The honey is generally speaking very dark coloured and almost useless; but the chief object is to obtain the wax, which is much the most valuable product.

The smallest bee build small combs around the branches of trees, but store but little honey.

FUMIGATING COMBS.

A member enquired as to the best method of fumigating frames of combs which were to be kept during the winter. The Chairman replied that sulphurous acid fumes would kill all germs of disease, and combs treated in this way could be used without any fear.

To an enquiry if this treatment would prevent mildew, Mr. Foord replied that sulphurous fumes killed both animal and vegetable germs, and would no doubt prevent mildew.

SPECIMENS OF BEEKEEPING APPLIANCES.

Mr. F. B. Miller suggested that a case for holding samples of the smaller beekeepers' tools and appliances, and perhaps, also, of specimens of bees, combs, &c., should be obtained and kept in the Club room. The Chairman stated he hoped shortly to arrange for the use of a room in the Athenæum in which to hold our future meetings. It was very desirable, he said, that the books and periodicals which had been lately purchased for the Society should be made available to members at once, and a bookcase for the purpose would be procured. The suggestion of Mr. Miller, he hoped, would also be carried out.

POISONOUS HONEY.

A conversation ensued on the subject of poisonous honey. Some members doubted if such existed, despite the various accounts—ancient and modern—of the fatal effects of honey. Mr. Nicholson said that in certain seasons bees in India collect honey which is undoubtedly poisonous to the natives. He had not, however, tried the effects on himself, but would be glad to send a sample of it to the Club for any member who might be inclined to try it.

Mr. J. J. Walsh was elected a member of the Club, and the meeting terminated at ten o'clock.

ORIGINAL CONTRIBUTIONS.

Beekeeping for Beginners.

Bees at Work.—A great deal of bee knowledge is gained by carefully watching bees going in and out of their hives on a warm sunny morning. One should never stand quite in front of the entrances when watching, but either to one side or at the back of the hive. If the stock is in a good healthy condition, bees should be going in and out in considerable numbers, unless during the winter months, when there is much less bee-business going on. If honey and flowers are about, one can judge of the strength of his stock by the numbers going in and out. It is often asked how many bees should enter per minute in a strong hive in spring time? This will depend upon whether young bees are hatching out and breeding going on rapidly. In a strong colony on a fine warm day in early spring, or even in our Australian winter, from thirty to sixty per minute would show a vigorous state of the community; but just before swarming time it is almost impossible to count the number entering per minute, as they often amount to hundreds. From thirty a minute upwards on fine winter days will indicate a good strong condition.

Beginner, in watching, will soon find out a remarkable difference in the movements of some bees as compared with others; some arrive at full speed, scarcely stopping to alight, but almost flying direct into the entrance; or alighting, bustle in as if they had not a moment to spare; others will loiter about getting in the way of the busy ones, take short flights and come back and hover about the hive. The former are the old bees hard at work, the others are either young bees exercising and sunning themselves, practising for longer flights on business, or drones out

for an airing. The latter are recognised at once by their larger size and the deeper-toned "buzz" of their wings. The busy ones are, some of them, seen to come home with little white, yellow, or other coloured balls on their legs, which is often popularly supposed to be wax. These little balls are, however, small masses of the pollen taken from flowers, a kind of coloured dust which is often seen to stick to the nose of a person smelling a flower, and in some flowers is very abundant. Now, this pollen is found on the stamens of the flowers, and forms a very nutritious food for the bees; they carry it home and pack it into some of the cells, mixing a little honey with it as they do so, and use it as food for themselves, and for the young grubs also after it has been specially prepared for them. This pollen has nothing to do with the wax. Other bees arrive without this pollen on their legs, and if observed closely, will be seen to appear a little larger than those carrying their little balls of flower dust, as if larger in the abdomen; these are bringing in honey or water. He will also notice that some worker bees, especially those playing about the entrance, are lighter colour than others; these are the young bees; the down which makes them appear light soon wears off however, as they get to the serious business of their life.

It is a very important thing in beekeeping to become familiar with the appearance of bees at work, for with a little practice the intelligent beekeeper is able to judge of the condition of the colony within by the behaviour at the entrance. If bees are carrying in no pollen, or very little, breeding is either going on very slowly or is stopped altogether, which in the honey-getting season may indicate some sickness of the queen, or the whole family, or the loss of the queen itself; and if on fine days when other bees are carrying pollen, those from any particular hive are not doing so, but are otherwise busy, we may be almost sure that the queen is lost or worn out. If disease exists in the hive it is generally noticeable to the experienced beekeeper in the behaviour of the bees at the entrance.

I am sorry to say that some bees have very little respect to the question of property, and if honey is scarce often become absolutely dishonest and most determined robbers. They will find out the hives that have honey and are not very strong in bees, or are perhaps without a queen; one or two will sneak in at first, fill themselves with honey, and sneak off again to return with some of their companions; often a fight occurs and many bees are killed, and if the occupants of the hive that is robbed are not strong enough to beat off the robbers, the colony becomes demoralised, and the bees even

help the marauders to carry off the honey to their hive, the robbed ones deserting or dying.

Experienced beekeepers often have a difficulty in ascertaining whether robbing is going on or not, except when it is going on wholesale or with fighting; but by carefully watching "bees at work," its signs can generally be distinguished. Bees at work will be seen to fly straight for their entrance and bustle in quickly, many however appearing heavy and tired; robbers hover about the alighting-board, or go smelling around the sides and back of the hive to see if there be any back entrance, and settling on the alighting-board try and get in, and flying off and trying again if they are noticed; but as there are generally a lot of young bees playing about, it is not always easy to see what goes on in this respect; if however bees that look full and heavy are seen to come out at the entrance, and instead of taking flight at once, crawl right to the edge of the alighting-board before doing so, robbing may be suspected. If one of these bees be caught coming out, and being killed is found full of honey, instead of empty, as all honest bees should be when they come out of a hive, then be sure robbing is going on. By dredging some of these laden bees with flour, you can mark them and ascertain if they enter any of the other hives in the apiary. Having found a hive being robbed, and the hive of the bees that are robbing, beginners will be able to adopt some of the numerous means for stopping this thieving work before the robbed colony is destroyed. Concerning the remedies for robbing, we shall speak further on, and the subject is only mentioned here to show the importance of beginners making themselves very familiar with the movements and behaviour of bees at work in an ordinary and honest manner, so as to be able to detect almost at a glance at the entrance and alighting-board of a hive how things are going on within.

Beekeeping in Queensland.

BY "PROPOLIS."

MONDAY, 8th March, 1886, being a nice bright, sunny day, and one calculated to make the heart of the bee wax merry, I having nothing in particular to do, and sitting on the verandah of "Leunan's" quietly smoking an after-lunch cigarette, noticing a Rosalie 'bus rolling along, decided to take a run out to Mr. J. Carrol's ('the pioneer beekeeper of Queensland,') and have a look at his apiary. Twenty minutes in the 'bus, then a walk of about a mile and a half, brings me to the gate, or I should say fence, and discloses to my view Mrs. Carrol collecting wood to light her fire,

or maybe the "smoker." After introducing myself, and mentioning I had called on her twelve months ago, she welcomed me warmly, saying I was in better luck than before, as Mr. Carrol was at home. I "jumped the fence," and we went in search of "The Bee-master," whom we found packing some beautifully-filled "sections" for the market. Of course this led off the conversation on the topic of sections, and I found we both agreed that the Black Bee produces the most regular and best-looking sections, but it does not fill them so fast, and therefore is not so productive as the Ligurian, but, to use the bee-master's own words, "the Hybrid or the Black, with a dash of Ligurian, is my pet." His opinion is that they breed better and store more honey than the Blacks, produce nicer-looking comb honey than the pure Liguria, are good breeders, and are not, as it is generally said, very savage, and judging from his stocks, which are mostly hybrid, they certainly are very easy to handle; but as it was a very favourable day, and we did not forget the smoker, I do not consider it a fair trial. As to sections, Mr. Carrol says he will in future use nothing else but the all-in-one-piece section, as they look so much neater and are so very easily and quickly put together. Our next topic was "foundation comb." Mr. Carrol, I found, uses the Given press, and says he will never use the rollers again, as the press can be worked so much faster and gives better results. What would friend Root say to this? but perhaps he has come round to this view. I notice his concluding remark when writing of it lately, is: "As the manufacturers are improving these presses continually, they may eventually make them to surmount all difficulties." Mrs. Carrol tells me that damping the dies with a very weak pearl-ash lye makes the wax come away very readily.

I noticed that a good trade is done in shipping bees. Mr. Carrol tells me he sends them all over the colonies, but principally to the northern parts of Queensland. He has to be very careful in packing them, as they often go for a couple of days on the top of a Cobb's coach, or which is perhaps worse, he has to send them by steamer, and "never mind how you tip the seamen, they will not be careful." He usually sends them with say three frames of brood, the spare frames being filled with foundation-comb, all the frames being screwed down to prevent them moving and thus killing the bees. It must be a very trying ordeal in such a climate, but he assured me that they invariably reached their destination in safety; of course, the comb is all wired, or it would not stand the knocking about. His plan of wiring is the same as that recommended by Root, except that instead of drawing the cross wires

diagonally across the frame, he draws two straight across at right angles to the others.

Our next move was to the garden, to see the bees themselves. I found the hives scattered indiscriminately about the garden, and some on the verandah. Those in the garden are almost hidden by weeds, which does not look very tidy, but is allowed, "as it helps to keep the bees cool," which certainly is a great item in this climate.

This has not been a very good season, but I am shown a stock, four stories high, which shows what they will do even in a bad season. We get the "smoker," and take off the three surplus boxes containing each forty-eight well sealed one pound sections, which have all been filled since October; before that, sixty pounds had been extracted, and as the season does not end for two months yet, there is still a good yield to be gathered.

We then took a walk amongst the hives, which are mostly kerosene cases cut short to hold Langstroth frames, and stocked with, in most cases, good hybrid bees.

Mr. Carrol tells me he imports from America anything new he sees in the journals, and as we are talking, he points out a case of implements which he has not yet opened, and which contains a new hive with reversible frames. He sets his son to work to open it, who, by the way, has just come in from school, and has, his father tells me, a mechanical turn of mind, and is never so happy as when driving nails or working among the bees. The hive turns out to be nothing out of the common, and the frames just ordinary reversible ones, so it has not been a good spec for the bee-master.

As the cows are now expected home, I am asked inside to have a cup of tea, for which I feel very thankful, as the day is anything but cool. I enjoy it as one only does when the thermometer is registering 90 degrees in the shade.

After thanking mine host for his trouble, and Mrs. Carrol for her good cheer, I take my leave, and walk back to the 'bus, soliloquising that if it pays to keep bees in England, when 100lbs. of extracted honey is a good yield, how it must pay to keep them in Queensland.

CORRESPONDENCE.

THE BERLEPSCH AND LANGSTROTH HIVES
COMPARED.

(To the Editors of the *Australian Beekeepers' Journal*.)

GENTLEMEN,—I have read with a good deal of interest the articles on the Berlepsch and Langstroth hives by Mr. Abram in your January and February numbers, in which he has endeavoured to show that the former hive

is superior to the latter. Having been intimately connected with the introduction of the Langstroth hive into Australasia, and as I by no means agree with Mr. Abram's conclusions, perhaps you will grant me space to reply to some of his remarks, and to compare the two hives in my own way.

The Berlepsch and Langstroth hives appear to be as different to each other in construction and shape as it is possible for frame hives to be, the difference in construction necessitating different methods of manipulation. Briefly, the Berlepsch hive, as described by Mr. Abram, is a box $23\frac{1}{4}$ inches high, $9\frac{1}{4}$ inches wide, and 16 inches from the entrance to the back. Along the sides—that is, from back to front—are small grooves for the projecting ends of the top bars of the frames to slide in. The brood frames, which are $9\frac{1}{4}$ inches long by $14\frac{1}{4}$ inches deep (outside measure,) run in one set of grooves, while the surplus honey frames slide in another set immediately under the top board or cover. It must be understood that the hive cannot be enlarged above, because in the bee house used by Mr. Abram the top of the hive (allowing 2 inches for the bottom and top boards) comes within 5 inches of the top, or the upper shelf of the bee house, as the case may be. The frames hang parallel with the entrance, and are manipulated from the back, which is removable for this purpose. The complete Langstroth hive, or what is usually understood as such, is a box, or rather two boxes, each 10 inches high, $14\frac{1}{4}$ inches wide, and $18\frac{1}{2}$ inches deep, from back to front, inside measure. The brood frames, which are $17\frac{5}{8}$ inches long by $9\frac{1}{2}$ inches deep (outside measure,) hang on metal supports, tacked on to each end of the hive, so that they run the reverse way to those in the beehive. This hive can be enlarged upward to any extent, and the frames are manipulated from the top after removing the cover.

The Berlepsch frame, as will be seen by the measurements given, is a short deep frame; while the Langstroth is a long shallow one. Mr. Abram lays great stress on the difference in the frames, and in advocating the use of the B. frame, he contends "that the high, narrow frame is more in accordance with their (the bees) nature than the low, wide one;" and further says:—"Any one who has found bees in their wild state in trees, &c. &c., will at once admit that they always select a place for their house which is much higher than wide, and there is no doubt that the nearer we approach to their natural habits, the more likely are our arrangements to be successful." I cannot help thinking that this part of Mr. Abram's argument has been unhappily chosen; for in the first place I believe it is

hardly possible to find a hollow in any partly decayed tree that is not higher than it is wide; if it were not so, we should scarcely find a hollow tree standing. I hold that being found in such places no more proves that the bees have selected them on account of their shape than a swarm taking possession of the space under the roof of a cottage proves that the place was selected on account of its width, or because there are shingles and rafters over head. I have known swarms to take possession of all sorts of curious places apparently without the least regard to shape or size; for instance, a hen-coop, a cask lying on its side, boxes lying on the ground, under fallen trees, &c., thus showing that they are not always particular about the shape or style of their habitation as long as it affords them shelter, and sometimes they are not very particular about that even. As for following out Mr. Abram's idea and approaching nature as near as we can in the management of our bees, I think the nearer we got the more unprofitable we should find them. Are we not working against their natural instincts when we check the swarming impulse? How else could such large crops of honey be obtained? Do we not control the breeding of drones, workers, and force the bees to raise queens when we wish, all of which may be, and generally is, against their natural desire at the time? and do we not *make* swarms or small colonies, very often out of season? In fact, in nearly all our operations under scientific management we work against the natural instinct of the bee, and only approach them when we are compelled to. Notwithstanding what Mr. Abram has said, I am sure he does not wish us to go back to the old log-hive, because it approaches nature nearer than the modern one. No, Apiculture would never have advanced to the stage it has had this idea been entertained all along.

Formerly, tall, narrow frames were largely used, possibly with the same idea that Mr. Abram has advanced; but with increasing knowledge, however, the tendency during the past ten or twelve years has been toward long and shallow ones. There are several very good reasons why a shallow frame is preferable to a deep one. First, shallow frames require shallow hives, which are much handier for those working them, and less liable to be disturbed by high winds. Second, they can be more easily manipulated than deep frames, and with less risk of injuring the bees, queen or queen cells; and third, a shallow hive with the same cubic measurement inside, will give more top surface than a deep one. This I look upon as a very important point, as it gives a larger extent of communication with the upper boxes. I find by measurement that

the top surface of the Berlepsch hive ($9\frac{1}{4}$ inches x 16 inches) contains 148 inches, and the Langstroth hive ($14\frac{1}{4}$ inches x $18\frac{1}{2}$ inches) 263 inches, only 33 inches from being double the size of the former. Calculating the comb capacity of the brood chamber in each hive, I find the Berlepsch gives for eleven frames, the full complement for the measurements given by Mr. Abram, each measuring $8\frac{3}{4}$ inches x $13\frac{3}{4}$ inches inside, 1320 inches, and the Langstroth, for ten frames, $8\frac{1}{2}$ inches x 17 inches, 1440 inches, which makes a difference of 6000 cells. I have found the brood-chamber of the Langstroth hive plenty small enough, and I certainly would not recommend the use of a smaller one, in our climates, at all events. It is, however, in the surplus parts of the hives that the greatest difference exists. I have already pointed out that the surplus part of the Berlepsch hive is a fixture, and cannot be enlarged under the system of management adopted by Mr. Abram. The frames of this measure inside $8\frac{3}{4}$ inches x $6\frac{3}{4}$ inches, which, multiplied by 11 (the number of frames,) gives 646 inches of space for combs, considerably less than a Langstroth half-storey, which gives 682 inches. What experienced beekeeper would care to work a Langstroth hive with only a single half-storey for a surplus box? I find in the height of the season that I require three and four *full stories* over the brood-chamber—never less than three; these give together 4320 inches of comb capacity, as against 646 inches in the Berlepsch surplus box—over seven times the space. There is, as I have previously remarked, comparatively no limit to the amount of room that may be given to a Langstroth hive, while, at the same time, it can be contracted to the smallest space required for a small colony, by the use of division boards, and herein lies a principle intimately connected with the most advanced system of Apiculture. It is a great puzzle to me how such a hive as the Berlepsch can be worked for honey with profit. I am quite certain that a person in charge of, say, fifty hives in a good district would be employed more than half his time in the season running after and taking swarms, especially with the use of the close honey-boards over the brood-chamber recommended by Mr. Abram.

I have something further to say in connection with the difference in the methods of manipulating the two hives, which I must leave till another time, as this letter has already far exceeded the limit I at first anticipated.—

I am, &c.,

APIS.

New Zealand, 10th May, 1886.

BEEKEEPING IN SOUTH AUSTRALIA.

THE cold weather we are now experiencing has brought the honey season to a close in almost all districts. For my own part I am glad it has come to an end, because eight months' continual work amongst the bees is quite enough in one year; and, moreover, it is desirable to have a little time to devote to preparations for next season's operations. The popular notion amongst those who have for years past kept bees in the old system is, that a good season comes only once in two or three years. And they explain this by saying that the gum trees do not flower every year. Now, while this may be true for certain parts of the Colony, where the gum trees are all of the same variety, it certainly is not for other places where many different kinds of these trees grow. For instance, Burnside, which is situated at the foot of the Mount Lofty ranges, has in its immediate neighbourhood four distinct varieties of gum trees, and during my experience in beekeeping some of these have flowered every year and yielded a good harvest of honey. Also, the trees on the plains come into bloom before those on the hills, so that the bees often continue to work on the latter for several weeks after the former. In what are called good seasons, the Cape marigold comes into flower at the end of August and keeps the bees busy until about the middle of October, when numerous garden plants offer good forage and enable the swarms to build up ready for the honey harvest. This commences in December, with the flowering of the redgums, and continues through January, February, and March, when the blue, peppermint, and Tasmanian gums flower in the order named. In this way a succession of bloom is kept up for seven or eight months, and bees of any kind in any sort of hive will give a good return no matter how they are managed. Now, let me describe a "bad" season, such as the one just ended. As before, the Cape marigolds are in flower during all September, the weather is fine and dry, and bees swarm in a wonderful manner. Swarms are so plentiful and cheap that numbers of persons are induced to make a start in beekeeping, and as long as the marigold flowers remain, everything goes on swimmingly. But, alas! the redgums fail to bloom, and from the end of October to the end of January there is absolutely no honey to be gathered. Then commences a struggle for existence, and robbing goes on in all directions. Prime swarms, that have been hived in empty boxes, clear out bodily and fly straight to the hills, evidently preferring the chance of bettering themselves there to remaining to meet death by starvation. During such times the bees, in

their efforts to find food, will visit breweries, jam factories, and grocers and other shops, and become a perfect nuisance in the neighbourhood. In February the bluegums suddenly come into flower, but by this time only the strongest and best provisioned colonies are left, and they are not in fit condition to take advantage of the magnificent flow of honey that is offered to them. In this manner the whole season is lost, and the careless beekeeper bitterly complains of his bad luck. But there are a few apiarists who know that by giving their bees a little care and attention during the bad time, they will be sure to reap a good harvest. They do not allow swarming if it can possibly be avoided, and everything is done to keep all colonies equally strong. In September, when hives are getting heavy from the marigolds, all surplus combs of sealed honey are removed and stored for future requirements. This honey, although not fit for table use, is excellent food for bees. If there is not sufficient of this to carry the colonies through the bad time, they are fed twice a week with sugar syrup. Only barely enough is given to supply the wants of each colony until the time arrives for making preparations for the harvest. It is easily proved that thirty-five days is required after an egg is laid until the bee from that egg is in its prime as a field worker. Therefore, thirty-five days before a flow of honey is expected, the colonies are fed liberally every other day, and the queen is kept at her full egg-laying capacity so as to ensure a host of workers at the required time. As soon as blossoms are seen on the trees, the old queen is removed from each hive intended to be worked for comb honey, a young laying queen is introduced, and the boxes are put on. In my own neighbourhood, the honey flow set in about the beginning of February, and steadily continued to the present time. I am informed that there is a good demand for honey, both extracted and in the comb, and that excellent prices are realised.

The solar wax extractor has proved to be of great use in South Australia, and will no doubt supersede the troublesome boiling-down machines.

The time has now arrived for sending to Italy orders for queens, and beekeepers are making up sets of a dozen. The usual way is for three or four persons to join together in an order for twelve queens to arrive here in October. On receiving the boxes, they are fairly divided before opening, so that each person takes his chance about the queens he receives. The Italian bees have proved themselves so infinitely superior to the blacks as honey gatherers in this climate, that they

are in great demand. The best results are obtained from the pure bred Italians, or the first cross.

A. E. BONNEY.

Adelaide, 1st June, 1886.

(To the Editors of the Australian Beekeepers' Journal.)

GENTLEMEN,—On the 3rd March I left Melbourne for a holiday. At this time I had four hives (Sussex bar frames,) well filled with bees, about nine frames being covered, all apparently in a healthy condition.

I returned home on the 3rd April, and the next day examined my hives. They had all dwindled to about five or six frames, no brood or eggs being visible. There was no honey in any of the hives, and I was unable to find a queen in any. I then commenced to feed with syrup, and at the end of ten days again examined the hives, when I was glad to find healthy brood and eggs in each. I continued feeding, but did not again disturb the hives until the end of May. I then found that in three of the hives the brood was all dead; some of the cells were uncapped, disclosing dead bees; no eggs or live brood could be found. The fourth hive was in good condition, not having dwindled any more, and healthy brood was still visible.

The day that I first noticed the healthy brood was a fine, warm, sunny day, and the frames were rapidly withdrawn and returned to the hives for fear of chilling the brood. I shall be glad to know if any of your correspondents can give me any explanation as to the cause of the dead brood.

ROBERT BARTON.

(To the Editors of the Victorian Bee Journal.)

GENTLEMEN,—As the winter comes upon us, and hives dwindle, those who have little experience of beekeeping are apt to find themselves confronted by problems of a somewhat startling character. We find, for instance, the outer frames of our hives with here and there a capped cell, containing dead brood of different stages of development, with the capping either perforated or completely sealed: and in these cases the question suggests itself as to the distinction between what has been so much written about under the name of "foul brood" and the alternative influencing cause—namely, the chilling influence of winter weather. Foul brood, if I have understood the explanations afforded by books on the honey-bee, is regarded as a contagious disease of the colony, pervading alike the tissues of the parent bees, the juices of the egg, and those of the brood in its various stages; first killing

and then transmuting the cadaver of the immature bee into a brown, viscous, ill-smelling slime; and this latter, when examined microscopically under high powers, is seen to be peopled by countless extremely minute oscillatory rods—bacteria, in fact. But, on the other hand, the chilled bee larva dies and falls into corruption according to the general law, with the development of bacterial life, without which, in one or other form, decay of animal tissues does not commonly proceed. Apart from the stench regarded as characteristic of foul brood, and which I do not recognise in the cells of the outer frames above alluded to, but which may nevertheless be there and recognisable by persons with higher olfactory powers than the writer; apart from the characteristic unpleasant odour, I find in the outer frames what appears to me as answering to all the characteristics of foul brood, including the presence of bacteria; but taking the juices of a crushed moribund bee from the same hive, I fail to find evidence of bacterial life in the latter. What, then, Messrs. Editors, I should be glad to learn is, the way to distinguish the concomitants of decay of the bee larva in its cell through chilling, from those of the decay consequent upon the disease known as foul brood, and pervading the colony in every stage of bee life and transformation?

Does foul brood originate in chilling? While some larvæ are killed by the cold and die in their cells, is it possible, and can it be proved, that others escape death by a narrow chance, and emerge with the seeds of bacterial disease pervading their tissues, to disseminate it through those of their progeny, and thus depopulate the hive? The disease must have a traceable origin in each case, but in what direction are we to seek it? If the purely speculative suggestion which I have ventured to make could be verified in cases of emerging drones or queens, it seems to my mind that the question of foul brood would identify itself with that of temperature of the hive and its regulation during the winter months.

I may add that I have given but little attention to the subject of foul brood, and have ventured to submit these guesses concerning the origin of the disease with the hope of eliciting the opinions of observant beekeepers, or what would be even more valuable, their actual experience in distinguishing the symptoms of death from chill from those of the incipient stages of foul brood, and especially anything which can throw light on the origin of the latter hereditary disease.

Phenyl is a reputed specific cure for foul brood, but a still more effective cure would seem to be promised could we succeed in

discovering the first nidus, the primary origin of the disease. We could then, in all probability, instead of curing the disease as often as it occurred, banish it altogether from our stocks.—Very obediently yours,

G. F.

Melbourne, 17th June, 1886.

NOTES AND NEWS.

How to find Black Queens.—I have found a way of finding the queen in ten minutes, without staring your eyes out, and I almost said, to an absolute certainty—for it has not failed in a single instance of half-a-dozen trials. My neighbour, A. C. Moore, is the inventor of the scheme. We help one another a good deal in bee work, and mutually profit by one another's experience. I had three or four hives I had worn myself out on trying to find the black queens and get them out. He had pretty good success with his own, and proffered to help me. After spending the whole of a hot afternoon in August without finding a single queen, most of his conceit oozed out, along with the sweat of his face. Next day he tried one of his own, with the same result, when he thought of fastening a perforated zinc honey-board into the bottom of the upper story in such a way as to sit down over the brood-frames, leaving no way of egress around it. Into this he lifted all the frames and bees, and also brushed in all the bees from the brood-box and bottom-board; then putting bottom-board and brood-box in place, he took up the combs one by one, and brushed all the bees back into the story with the zinc in the bottom, placing frames in brood-box again. As soon as all were out, he put the cover on the story with the bees in it, and set it on the brood-chamber. Then he left them twenty minutes or so, and on taking up the cover he found that all the bees had gone down through the honey-board into the brood-chamber except the queen and a few retainers, among which she was easily seen and caught. But when I tried it, *the bees wouldn't go down* of themselves; so instead of the cover, I drew over them some mosquito-netting and smoked them down. At first I had my doubts, thinking the queen could get through the perforations if she would try seriously; but after watching a not very large queen for several minutes, I concluded it would be a very small one that did. Of course the queen might fly up into the air, as many of the bees do, and escape the trap, but so far they never have.—*Gleanings in Bee Culture, A.B.C. Scholars' Experience, December, 1885.*

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EDITORIAL, NOTICES, &c.

FOUL BROOD AND VARIOUS METHODS
OF CURE.

THE disease known as *foul brood* is undoubtedly the most formidable and destructive of bee diseases, and the one most dreaded by all beekeepers. It is extremely contagious and rapidly ruins a whole apiary if it ever gets an unchecked hold of the hives. For a long time it was regarded as incurable, and eradication by destruction of bees, combs, hives, and all, was considered the only means by which its ravages could be stayed. More recent experience has given apiarists methods for controlling the disease, and it has been clearly shown, within the last year or two, that it is curable by very simple methods carried out with great care.

The fact that foul brood is *very contagious* should be fully recognised by all beekeepers; the germs stick to every thing belonging to the hive, even to the bees themselves, and it is considered very probable that they leave infection in the flowers they visit, so that bees from other hives or other apiaries pick up the germs in seeking for their stores, and so carry infection to their hitherto healthy hives. Pieces of comb from a diseased stock offer a sure source of infection; and although Mr. Cheshire states that no germs are ever found in the honey itself of a foul-brooded hive, we should be very sorry to use such honey for healthy stocks, without disinfecting it by sealding or adding carbolic or salicylic acid to it. A single foul-broody stock left to the ravages of the disease will infect a whole neighbourhood, it is therefore of immense importance that its existence should always be carefully looked for, and

quickly and vigorously dealt with immediately the smallest beginning is found. It would be just as blameable and unfair to one's neighbours to allow this malady to go unchecked, as to permit scabby sheep or cattle afflicted with contagious disease to roam about among our neighbours' flocks and herds.

The signs of foul brood in hives have already been described in these pages, and is given in almost all bee books. The sickly odour of an infected hive is often referred to as the plainest and most unmistakable indication, but when the disease has progressed so far as to attract attention by its peculiar and offensive odour, it has already spread its mischief abroad. Of course the presence of the foul brood germs (*Bacillus alvei*) is not discoverable by ordinary means until it begins to be fatal to the young brood, and the bad odour does not become evident until a large quantity of brood is killed and has become putrid.

The bees of a hive affected with this disease do not die with it, and work on as usual until the colony gets weak for lack of young bees to replace those dying from age, when they appear to lose some of their bustling vigour and become dull and listless; but little help therefore is afforded by the behaviour of the bees themselves towards detecting the presence of the disease within the hives in its early stages. An examination of the brood combs, however, soon settles the question. If all the young grubs not yet sealed over look *pearly white* and healthy, and those sealed over are clustered about one part of the comb, while all other cells, round about which are unsealed, are either empty and clean or filled with honey, there is no foul brood; but on the other hand, if the grubs look a little dirty or

brownish, and we see here and there scattered among empty cells some still covered with sunken caps, it is a suspicious sign. Uncap one of these cells, and if instead of a dead or live unhatched bee you find a brown grub with its tail pointing outwards, or a nasty brown glue-like mass, half filling the cell, which drags out like thick glue when stirred with a pointed stick, you have the commencement of foul brood most certainly. And if you see large groups of sealed cells with the covers sunken instead of slightly projecting, which on being opened are found to contain this glue-like remains of the grubs, the disease has reached its destructive stage, and has probably spread the germs among other hives.

We will now briefly refer to some of the numerous methods of dealing with this disease, many of which have been found more or less successful. These range from a complete and immediate destruction by fire of bees, combs, hives and all (a course that some beekeepers still adopt and advocate,) to the more modern attempts to actually cure the disease without sacrificing a single bee or a single comb except in unusually bad cases.

The various methods may be enumerated under three heads:—1. Complete destruction of bees, queen, combs, hives, &c., by fire. 2. Removal of queen and bees from diseased combs, and brood into a new hive. 3. Treatment by drugs, vapours, and disinfecting (or germicidal) food.

As regards the first, nothing need be said beyond the fact that it has been very largely adopted and advocated, especially in America, as the only *safe* cure, and only prevention against spreading the disease. In carrying out this plan, every care should be taken to be merciful to our little friends, and they should therefore be rendered thoroughly insensible by puffball smoke or chloroform before proceeding to final destruction.

The methods under the second head are carried out in several different ways. First, then, we may simply shake all the bees out of the hive (after a good smoking) into another hive; or better, first into a box and from thence into a new hive, where they will have to start anew and build fresh combs, in which they will be greatly assisted by frames of foundation comb. They must be fed freely with syrup. 2nd. They may be shaken or removed from the hive or combs (after being well smoked) into a ventilated box, in which they are to be kept for several days until nearly starved, and then placed in a new hive with fresh clean combs; or better, comb foundation, and fed freely with syrup. 3rd. They may be treated as in the first case, and the food given to them mixed with either phenol, salicylic acid, or camphor.

In all these cases the hives, if common boxes, should be burnt, and the combs and honey saved. Combs, if badly affected, should be burnt, honey extracted from the others and thoroughly scalded for feeding, and the combs themselves melted down as wax. If frame hives, boil the frames thoroughly, first with washing soda and then with carbolic soap, and clean the hives with hot soap suds, to which common carbolic acid has been freely added. To be safe, the hives should be treated the same way a second time before being used again.

Under the third style of treatment, we have the more modern and scientific methods of using disinfectants and germ-killing food. Many modes of doing this have been adopted.

First, we have fumigation of the hives by disinfecting vapours, such as from *burning dried thyme*, a favourite method in many parts of Europe; placing camphor in the hive, which soon becomes filled with its vapour; fumigation with the vapour of salicylic acid produced by heating the acid in a spoon or on a metal plate by means of a lamp.

Secondly, we have a method by simply feeding the bees with medicated food, such as syrup, to which a little camphor, tincture of salicylic acid, or pure carbolic acid crystal has been added. The germicidal properties of these medicines in the food which the bees use for themselves as well as for the brood is supposed to quickly destroy all the germs and gradually restore the colony to a clean and healthy condition. Then we come to the phenol treatment proper, advocated by Mr. Cheshire, where syrup, with phenol (pure carbolic acid crystal) is given as food in feeders or is poured or sprayed over the combs regularly, every three or four days, until the disease disappears by the destruction of both germs and spores which cause it, by the action of the phenol.

The simplest methods are those which only involve changing the bees from an infected hive and combs to a new hive with frames of foundation, and feeding either with simple or medicated food, and, as a rule, such methods are successful. By Mr. Cheshire's phenol feeding, and by the several kinds of fumigation, no change of hives is necessary; combs, &c., are saved, and if the disease is stopped the colony has less to do than if it has to start a new hive.

We are not prepared to say which method, if any, has been found universally more successful than any other, for although beekeepers who have tried any particular plan and have succeeded, naturally advocate it. Every method in turn has certainly failed in some cases.

We want more experience and further diligent and careful experiment. We have,

however, a gentleman in Australia who has most diligently investigated this bee disease, and obtained remarkable success in its treatment by some of the methods referred to above. We refer to the experienced and well-known apiculturist, Mr. A. E. Bonney, of Adelaide, and we hope shortly to place before our readers an article from his pen upon this most important matter, which cannot fail to be of great value, and will possibly remove our present doubts as to the best mode of treatment of foul brood in Australia.

In a future number we hope to give definite instructions for carrying into practice several of the methods of cure we have spoken of.

HINTS FOR THE SEASON.

HIVES should now be got ready for the coming season, carefully cleaned, especially inside, and for this nothing is better than a scrubbing brush and hot soapsuds, to which is added a tablespoonful of common carbolic acid to every gallon. Let the bottom boards inside of the hives and roofs be well scrubbed with this and put out in the sun to dry. They should then be painted outside, so the paint is well hardened before the hives have to be used.

Frames should be now got ready for inserting the comb foundation, and all frames of combs saved from last season, except such as were taken from diseased stocks, or stocks suspected of disease, which should be destroyed *in toto*, should be examined, and if in good condition put away ready for use, for they are very valuable to help on stocks and swarms in the early season. Any that have signs of moth, grubs, or other insects, should be fumigated in an old barrel or box with the vapour of burning sulphur.

Arrange at once where any new stocks or your early swarms are to be placed, and prepare the ground ready to receive the hive. If any sowing of bee plants is to be made, it is now time to prepare the ground. Many hardy plants should be sown in August or early in September. Sunflowers are very useful, and by successive sowings from now till January, or even later, they will furnish a constant supply of pollen right into the winter. Borage, phacelia, centaury (corn cockle,) all splendid honey plants in this climate, can be sown in succession; but phacelia does not stand the hot, dry weather, and should not be sown later than November. If one possesses a vegetable garden, let some turnips and cabbages run to seed and bloom, and sow some common mustard for early bee food. Aniseed makes a good bee plant and should be sown soon. A favourite bee flower in England, the *Linanthus Douglassii*, does once, well here in spring, and should be sown at as it will only do well up to about November.

JOTTINGS FROM COLONIAL, ENGLISH, AND FOREIGN BEE JOURNALS.

THE *British Bee Journal* has recently devoted some considerable space to *non-swarming* management, from which it appears that working for section-box honey conduces to swarming, and that non-swarming can only be secured by giving plenty of room to the bees immediately a honey flow commences, and working for extracted honey. One method described may be briefly described as follows:—The stocks must be very strong before the first honey flow begins, and the queen must be young and fertile. The bees are kept by division boards to only as many combs as they can cover, but are given outside combs as they increase till the hive is full of frames and bees almost overflowing, then another hive is put on the top with *frames of comb*, which is soon taken possession of by the bees. They rapidly increase, and store honey, and if the season is good a third story, with combs or frames of foundation is soon wanted, and even a fourth, which is inserted between the second and third. By this method the extracting can be done at any convenient time, or it may be left till a lull in the honey flow occurs, or till the end of the season, when all the honey in the hive is ripe and sealed. By this method it is stated all desire for swarming is prevented, and the colony gets enormously strong, and collects very large quantities of honey. This is the plan adopted by some of our Queensland friends, who reap such gigantic honey harvests. It is only the hives that do not swarm that give us the big yields. *Swarming and honey* returns seldom go together.

In the same journal we see Mr. Simmins, who writes a good deal upon the art, advertises a new and original non-swarming system, which also depends on giving the bees plenty of room directly they begin to increase rapidly in spring. As far as we understand his method, it seems he places his frames across the hive from side to side, not from back to front as in the Langstroth, and keeps his bees breeding at the back of the hive, and giving them frames with starters of foundation only, in the front of the hive as they increase. At the same time he places sections with combs already worked out over the back frames of the hive, and he states the bees rapidly fill these sections, while the room given in front of the hive for increasing the size of the nursery prevents the swarming impulse arising, and the bees devote their whole energy to filling the hive. Mr. Simmins' method is published in a pamphlet entitled *A New Era in Bee-keeping*.

It has been assumed that the presence of *bacilli* in bees, means disease in bees; but the Editor of the *British Bee Journal* has crossed

lances with Mr. F. Cheshire on this point, and adduces strong evidence that *bacilli* in the fluids or even tissues of bees does not necessarily mean disease; if this be so, our new ideas about foul brood require revision.

Carbolic acid vapour has been used (and is recommended) as a bee-quieter instead of smoke; it is said to be more effective (immediately quelling the most turbulent stocks) and easier to use than smoke. Great care however is necessary that no acid drops into the hive, or the bees may vacate or become so alarmed as to perish in large numbers. The vapour is obtained by fixing a sponge in a wire cage inside a good smoker, dropping on it a few drops of a mixture of one part carbolic acid, two parts glycerine, and four of water. The sponge must not be saturated, but have only as much as it will hold without any chance of dropping.

A new species of honey bee may be said to have found its way into English apiaries, namely, the *South African bee*, which is stated to be very much like the Italian, but brighter, and a vigorous stinger.

As is usual, there is no little controversy as to the propriety or necessity of wearing gloves and veils in apiculture. No argument will ever settle this question. Every one can see better without a veil, and feel better without gloves than with them—some don't feel the stings of bees, but some do very acutely, and it is simply a matter of taste whether the pain and swelling from stings, or the obstruction of veils and gloves, are the greater evil. A beekeeper must be short of common sense if he suffers much from stings, and still manipulates them without protection, just because it is stated "*no experienced beekeeper ever wears gloves or veils.*" Many of our veteran apiculturists don't despise such protection, although they are fully aware of the advantages resulting from being able to do without them.

A writer in "*Roots' Gleanings in Bee Culture*," for 15th May, says that he watched bees gathering pollen from cactus flowers, and states he found that they used honey for making it stick in the pollen baskets on their hind legs; for, he states, the pollen taken from the bee stuck to the finger and tasted sweet, while that from the flower would not stick and had no sweet taste.

PROCEEDINGS OF BEEKEEPERS' SOCIETIES, &c.

South Australian Beekeepers' Association.

ANNUAL MEETING.

ON Thursday evening the annual meeting of the S. A. Beekeepers' Association was held

in the Chamber of Manufactures. There was a fair attendance. Mr. S. Solomon, who occupied the chair, stated that Dr. Poulton had sent a box of foundation combs. Messrs. A. W. Sandford and Co. had offered to assist the beekeepers to find a market for their produce. The Secretary (Mr. A. E. Bonney) read the second annual report, which stated that the Association had just passed through a bad season, *i.e.*, one in which the gum trees flowered so late as to necessitate skilful management in order to secure a honey harvest; but in spite of this, apiculture had made rapid progress in South Australia. The movable comb hive was to be seen in use in all parts of the country, and bees were managed in an intelligent and scientific manner. It had been clearly shown that the Ligurians, from their more energetic nature, thrive where their black competitors could not find an existence, and they were always first to take advantage of a flow of honey. Meetings had been held regularly each month throughout the year, and papers read. Most of the papers were written by experienced apiarists, and the information contained in them would prove highly instructive to beginners. In March last an exhibition of bees, honey, and appliances was held at the Exhibition Building in connection with the Royal Agricultural and Horticultural Society's Show, and the thanks of the Association are certainly due to the Royal Agricultural and Horticultural Society for its generosity in giving a substantial sum of money as prizes for the apiarian exhibits on that occasion. It was gratifying to note the energy with which local manufacturers had striven to meet the requirements of those engaged in the bee-keeping industry. Almost all the articles required by the modern apiarist were now manufactured in the Colony in such an excellent manner and at so reasonable a price that they would certainly compare favourably with similar imported goods. One of the best inventions yet introduced was the solar wax extractor, which had proved itself well suited to our climate. By the aid of this simple contrivance, the usual dirty and disagreeable method of converting old and refuse combs into wax was avoided, and the operation was performed in an easy manner by utilising the heat of the sun. The most important literary productions pertaining to the industry that had appeared during the year were the *Australian Bee Manual*, by Mr. Isaac Hopkins, published in New Zealand, and *Bees and Beekeeping*, by Mr. F. R. Cheshire, of England. At present only the first volume of Mr. Cheshire's book had been published. The illustrations, which had been drawn by the author, were very excellent,

and surpassed anything of the kind that had yet appeared. In December last appeared the first number of the *Australian Beekeepers' Journal*, a monthly publication devoted to bees and beekeeping, and edited by Messrs. R. L. J. Ellery and J. H. Kitchen, of Melbourne. The committee had issued circulars to members asking for information regarding their operations during the season, and although these were not responded to as well as could be desired, it was thought that the results would prove interesting. The best reports were from Mr. W. Stevens, who took 997 lbs. of honey from nine hives, including 556 lbs. from one colony of Ligurians and its increase; Mr. S. Randall, who commenced with two hives in spring, and took 293 lbs. of honey; Messrs. Brooks had one hive, which was increased to four, and 265 lbs. of honey obtained; and Mr. A. E. Bonney, who began with four hives, increased to twenty-one hives and thirty-five nucleus-boxes, reared more than 100 queens, and took 820 lbs. of honey. Foul brood continued to cause trouble to beekeepers throughout the Colony, but it was satisfactory to note that strenuous efforts were in many instances made to get rid of that pest. As a rule, those who had once eradicated the disease from their apiaries had not been troubled with it again. A notable instance of this was Mr. W. Stevens, who was perhaps the first beekeeper to successfully apply the salicylic acid remedy when troubled with foul brood several years ago, and who had kept his bees healthy ever since. The committee urged all members whose hives were afflicted with the dangerous disease, to make every effort to get rid of it before the end of winter. The Chamber of Manufactures took advantage of the Bill which was passed during last session of Parliament to prevent any but Ligurian bees from being kept on Kangaroo Island, and sent there several colonies of that superior race. After these bees had been well established it was reported by several persons that black bees existed on the island, and to set the matter at rest, the Chamber issued a number of circulars to residents, asking for information on the subject. At the monthly meeting of the committee held on 3rd March, Mr. F. Conigrave submitted the following report:—"Of the forty-five circulars issued, twenty-three have been answered. The result is eminently satisfactory, as it shows that there are no black bees on the island, and that the Ligurians introduced through the action of the Chamber are almost all doing well. There is, therefore, every prospect of a thoroughly pure supply of Ligurian bees

becoming established. One apiarian has already reared fifty-eight Ligurian queens, and says that not one was impurely mated. It appears that years ago there were some black bees introduced to the island, but they, some time ago, all died out. The only vestige of them is the statement of Mr. Hicks, that his boys have seen black bees in the scrub, but judging from all the other reports there is very little doubt but this refers to the native bee. This insect is spoken of in the report of Mounted-constable Withall, who says:—"In answer to Question 5, I would mention there is what is called the native bee, and which I am informed is totally distinct from the wild bee. The native bee builds its nest in the dead stems which grow up from the grass-tree or yacka bush. The honey is obtained from the stems of the yacka bush, which when in bloom produce a large quantity. It is also got from the wild honey-suckle, which grows all over the island. I have myself on one occasion, when visiting the West coast of Kangaroo Island, cut off about three feet of a dead stem from the yacka which had bees in it. I plugged up the hole and brought it home. I tied the stick to a verandah-post and took out the plug. I do not know how long the bees would have lived, but I had them for three weeks when the stem got broken. The bees seemed quite at home while I had them." Mr. J. Turner, of Smith's Bay, after giving the answers to various questions, adds:—"My bees are doing splendidly this season, making a fine lot of honey—in fact, I never saw bees do better, and I have been used to bees since I can remember. I work my bees with the Langstroth bar-frame hive, and think it a great improvement on the old style of kerosene-box. I have sold four swarms and given two swarms away this season, and have five swarms left." Mr. Albert Waterman, of Cygnet River, says:—"I have noticed a kind of wasp very much resembling the black bee in this district, which probably Mr. Grainger mistook for bees." Mr. A. E. Bonney, to whom I have referred these replies, considers them very satisfactory. The native bee spoken of will not, he says, prove any hindrance to the establishment of a pure Ligurian strain on the island, its habits being so different as to prevent likelihood of mixture." The Chamber had recently handed over to the Association all business in connection with the distribution of the Ligurian bees which were imported last summer. Committee drew attention to the assistance rendered to apiculture by the Chamber of Manufactures. It was a fact that with the

exception of New Zealand, the beekeeping industry was in a more advanced state in South Australia than in any of the other colonies, and that this was mainly due to the efforts of the Chamber. There was every reason to expect a good season. Those excellent honey-producing trees, the red-guins, were now profusely covered with buds, which should expand into bloom about Christmas, when a large return might be confidently expected from all strong colonies. With a climate well suited to beekeeping, and magnificent honey resources, it was evident that the industry ought to prove a success if those who undertook it would prepare themselves for the necessary work by studying some practical book or by gaining experience from a skilled apiarist. The balance sheet showed—Receipts, £13 5s. 8d., expenditure, £11 17s., leaving a balance of £1 8s. 8d. Mr. Molineux, in moving the adoption of the report, mentioned that in North America last year there were 300,000 beekeepers, and they had taken 100,000,000 lbs. of honey. He referred to the prospect of an excellent season here, and remarked upon the circumstance that many of the beekeepers had been taking honey up to the present time. Kangaroo Island gave a chance in beekeeping not to be found in any other place in the world. The bees there were protected by a law, the island was rich in honey-bearing plants, and the black bee was absent. The wild bee was very beautiful, but it was non-social, and would not be likely to interfere with the Ligurian. Mr. A. Colman seconded, and the report was adopted. The Chairman suggested that a colony of the wild bee might be secured and the value ascertained. Mr. Molineux said some of the islanders had promised to get some of the bees referred to. Reports from the members as to what had been done during the year were read from twenty beekeepers in various parts of the colony, and on the whole the reports were satisfactory. Mr. Bonney resigned his position as Secretary, and his services were spoken of as being most valuable. The election of officers took place as follows:—President—Sir R. D. Ross; Vice-presidents—Messrs. S. Solomon and A. E. Bonney; Treasurer—F. A. Joyner; Secretary—Mr. J. Robertson; Committee—Messrs. L. Chambers, C. F. Clough, R. H. Mais, S. Randell, W. Stevens, H. H. Dollman, A. Molineux, J. H. Walters, —James, J. Little, E. A. Coleman, J. H. Weidenhoffer, R. Fiebig. Mr. E. A. Coleman read a paper upon "The Manufacture of Comb Foundations," which he explained were composed of comb-sheets indented with the shape of the cells and

coated with wax. They were used in the hives as foundations for the combs and to facilitate the operations of the bees. Their advantage was the improvement of the form of the comb, the saving of wax, and also of time. At the close, Mr. Coleman showed some of the sheets referred to in his paper, and gave an example of the mode of making them by an ingenious appliance.

ORIGINAL CONTRIBUTIONS.

Hints on the Use of Honey.

BY H. NAVEAU.

How great a boon is health to a human being; and still, although the allwise Creator made so small an insect as a bee, to collect medicine for every case in man's life, yet he does not avail himself of this privilege. Instead of going to the storeroom of the honey bee, he prefers to go to the doctor's shop, and gets a mixture made up by the "ugly fingers of bungling men." Few men only understand and realise by constant use what virtues are contained in pure extracted honey. True it is, that by far the greatest portion of those who do make use of honey, only take it for a cold or cough, but not many employ it as a sweetener for their drinks and confectionery, or use it on the table as well as jam or jelly. Those, however, who do use it, and partake of it at their daily meals, do find that the benefits they derive therefrom are inestimable. But the honey I write about now, is not that honey which often passes under the name "Finest Honey," which has not even the flavour of it, and is prepared by a well-known jam manufacturing firm in another colony. Real honey, as collected by the bees, has the flavour of the flowers from whence it is gathered, and at a low temperature at times (in about three weeks) it granulates, and by-and-by becomes so solid, and those who purchase it in this state should put the tins in boiling water first before they open them; or if in bottles in a warm place, and the honey will melt again. But this is not required by the so called "finest honey." For this is only sugar which has been subjected to boiling heat, and hence has lost its power to crystallise. Some people, chiefly the Germans, when they take their honey, cut out only those combs which contain pure honey; but instead of straining the same, put it in a saucepan on a slow fire, until it is all melted, and then let it cool. By so doing, they get the wax on top and the honey below. This honey hardly ever granulates, but it has lost the best part of its aroma. Now, as there are different kinds of honey in the market, it is of the utmost importance to know which is the best and most

wholesome for the use of man. The best honey mostly always granulates very quickly; but there is in some parts of this colony, chiefly in those districts where the heather abounds, a honey which does not crystallise at all, because it does not contain a sufficient quantity of saccharine matter. This honey is of a greenish semi-transparent colour, and has a peculiar flavour. I have met with people who were not judges of good honey, and when I did show them the very best, they said they would not have it, for they feared it was mixed with sugar. I do not think it would pay a beekeeper to mix the honey with sugar, although it certainly does pay a jam manufacturing firm to take 2d. worth of sugar, mix it with water, subject it to a boiling heat, and then sell it at 3d. per lb.; but this article does not granulate, and it is easily discernible that there is no honey in it. As it may be both interesting and instructive to show in how many instances honey may be used for food and medicine, I shall in my next quote a few recipes I got from Mr. T. G. Newman's valuable work, *Bees and Honey*.

Bee-farming.

BY W. ABRAM, ITALIAN BEE FARM, PARRAMATTA, N.S.W.

THAT profitable bee-farming can be attained by experience and practice, we have proof of in America as well as in Europe, and there is no doubt but that the same result is attainable in Australia. But be this as it may, the fact is that before my arrival in Sydney, no well-trained bee master had landed on these shores with the intention of making beekeeping his only occupation; and it is in consequence of my company's persevering efforts that beekeeping here now stands acknowledged as an industry. It is over four years since my arrival here. Although devoted to bees all my life, and trained by one of the greatest authorities in bee culture, and having successfully managed large bee-farms in the low plains of North, and in the high mountains of South Europe; also having been accustomed to the black bee, the Carniolian, the Ligurian or Italian, the Egyptian, Syrian, and Caucasian; and having had experience with about twenty different hives, from the old-fashioned straw skep, with its immovable combs, to the most improved frame-hive, I was well aware that it would require at least two years to become familiar with the flora and climate of Australia, and that I must gain experience sufficient to enable me to appear before the public, not as a mere adventurer, but to show that well-established facts testify the truth of my assertion. Difficult and trying were those two years; but my troubles and cares have

proved successful. I commenced operations with only a few stocks, the Italian queens of which I brought out with me; and soon after we imported some from America. I increased in the summer 1882-83 to 50 stocks; in 1883-84 to 98 stocks, and yielded 4000 lbs. of honey; in 1884-85 to 160 stocks, the yield being 10,000 lbs.; and in 1885-86 to 240 stocks, and 15,000 being the honey-harvest.

The few months of last winter were very mild, and the bees commenced breeding in July. With the beginning of the orange-blossom—this year exceptionally plentiful in September and October—the wonderfully favourable weather made it a pleasure to see the busy little creatures hurrying in and out from early morning to sunset, as if they were never tired of their pleasant occupation of honey-gathering. My Italians forgot swarming, decreased their brood, and filled the cells with honey; and I could begin extracting in September, while in former years not before December. What splendid honey it was; so white and clear, and with a delicious flavour and aroma! The yield was over 3000 lbs. of this honey. I left plenty of honey in the hives, as I expected less favourable times to follow. But soon after, different trees in the bush commenced flowering, and continued to furnish plenty of sweet nectar till March.

In November and December the ti-tree opened its flowers; but the honey is of a dark colour and too tough for extracting. Although the yield was over 1000 lbs., I do not place much value on it. The comb filled with this honey has a dark brown appearance. The honey of the white gum is also dark, but easy to extract when fresh. Some persons like this honey very much, and I extracted 4000 lbs., the flowers being so plentiful and the weather suitable. Ironbark, some box and stringy bark followed. That honey has a nice colour and good taste, and yielded 6—7000 lbs. Taking into consideration the increased sale of hives, extractors, queens, and stocks, as well as the yield of honey and the increased stocks, I am satisfied with this season's results. I was further successful in keeping my Italian bees pure, and in improving them. There are no black bees found on our bee-farm, they evolve decrease around here, partly in consequence of no care being taken by their owner to save them, partly because it seems as if the Italians were earlier and later, and everywhere to gather honey, not leaving enough for their black fellows to exist. I have reared over 500 queens this season, which required a great deal of my time, and I was able to do all the work connected with the bees, while in the extracting a boy assisted.

When I arrived here not much was known about different races of bees. I could have

brought other queens with me besides the Italians, as I have worked them side by side with the Italians, but the latter have the best qualities combined. Although I am not the first introducer of this race of bees, my success in keeping them as pure as they could be found in any place, without year after year importing fresh stocks from other countries, is without precedent in these parts.

Australian climate and flora are most suitable for the prosperity of the bees. Theoretical and practical knowledge is taught in papers, books, &c., and can be gained by experience; and although some time may elapse before exhibitions of bees and their products will be held in this, as in other countries, the great advance in bee culture in the last few years is most noteworthy. Not every beekeeper will be as lucky as Messrs. Spry, of Brisbane, whose yield last year, as stated under "Notes and News" for April, was 650 lbs. a hive average. One hundred pounds a hive is not bad, but too much is not advisable. The production of honey has increased more rapidly than the consumption already. To find ways and means to bring to the consumers' notice the great advantages of honey as a more wholesome and more economical article of diet than butter, and to sell really pure honey in the best-liked forms, should be the chief aim of all who keep bees for honey production.

NEW BOOKS, REVIEWS AND EXTRACTS FROM FOREIGN JOURNALS.

Hints for Winter.—The chief thing to look out for now and guard against is robbing. Any weak or queenless colonies are pretty sure to fall victims to marauders just now, unless every precaution is taken. The best way to prevent anything of the kind is to unite those that are likely to be attacked with others, and thus have none but strong colonies that are able to repel any attack made upon them. Small colonies, with young, vigorous queens, may be kept breeding late in the season, and so work them on till they are strong enough to winter safely, by supplying them with plenty of food and built-out combs from time to time as they require them, and crowding the bees together with division boards. Strong nucleus colonies may be served in this manner. Entrances should be contracted, and at least once a day an outward inspection of the hives should take place. Should any pieces of wax (cappings) be seen at the entrance of a hive, it may at once be concluded that robbing is going on in that particular hive, and efforts should be made to

stop it. The method I adopt in such cases myself, is to lay a cloth across the entrance to the hive, and from a watering-pot, held a good height above the cloth, I pour water over it and the bees flying about the hive. In two or three minutes I remove the cloth, and let the bees out that are near the entrance, without letting any in. I repeat this process several times, when it generally has the effect of frightening and clearing out the robbers. Any colonies that are short, or likely to be short of food for winter stores, should be fed up while the warm weather lasts, but great care must be taken that robbery is not allowed to take place. To guard against this, it is best to give the food the last thing in the evening before dark. Syrup is the best food while the weather is warm. To make it, let the sugar be good, and put half-a-pint of water to every pound used; boil for a few minutes, and keep it well stirred to prevent burning. Burnt sugar is poison to bees. Empty combs make the best feeders. Lay a comb on an inclined board at about the same angle as an ordinary writing desk. Take a tin (jam tin will do) and punch some very small holes through the bottom, and, holding this a foot or so above the comb, pour some of the syrup into it. The fall of the syrup from the tin will force it into the cells. When both sides are filled, hang the comb up to drip before placing it in the hive. If no empty combs are available, convenient feeders may be made by nailing thin laths into wood frames to form shallow troughs, which should be coated with melted wax before being used. The troughs can be filled with syrup, and the frames hung in on the centre of the hives. Top boxes that have but few bees in should be removed, and the empty combs put in the fumigating room, or, in the absence of this, they may be kept in the hives, which should have a little sulphur burnt in them occasionally to kill the bee moth, &c., and their larvæ. Several hives may be piled on each other, and the sulphur burnt on top, under the cover. The combs should hang at least an inch apart in the hives. All spare hives, &c., before being stowed away for the winter, should be scraped and cleaned, and be brushed over with a strong solution of carbolic acid. Now is a very good time to overhaul the covers of hives, and paint those that require it. A leaky cover will do much injury to a colony.—*"Apis," New Zealand Farmer.*

FOUL BROOD AND CAMPHOR.

WHEN this disease has visited a district, its eradication is extremely difficult. The germs being scattered far and wide, it is not wonderful that we frequently hear of the disease breaking

out again, more especially if we bear in mind that any one germ, under favourable conditions in a hive, can grow and multiply at such a rate as very soon to completely destroy it. Those who have had foul brood in their hives during the past season we would recommend to be on their guard, and take such measures as will ensure the disease not breaking out again.

It is generally in spring that foul brood first shows itself, and then much more difficult to recognise. This is why so many allow it to get to a more advanced stage before they are really aware that they have it in their hives. When foul brood is tolerably advanced, it is easily recognised, as the caps of the sealed brood appear pierced or partly removed, and the cells contain a putrid stinky coffee-coloured substance, which is all that remains of the sealed larvæ. If the head of a pin be inserted in this substance, it can be drawn out into long threads, and in this respect it differs from chilled brood, in which the remains of the decayed larvæ are watery and not tenacious. Frequently foul brood may be recognised even without opening a hive. Numbers of bees will be seen at the hive entrance vigorously fanning, and at the same time the air drawn from the hive will have a putrid, nauseating odour, which can be perceived several feet from the hive. The disease should not be allowed to get to this stage, but attacked when it first shows any signs of being present. It requires a careful scrutiny of the combs to recognise foul brood in its earliest stages, and even then the novice may fail to do so.

On examining the brood, notice must be taken of the larvæ. If diseased, instead of lying curled round at the bottom of the cell, they are generally turned in such a way as to show their backs and move about in an unnatural way. These larvæ, instead of being white, have a slightly yellowish tint, which deepens as the disease advances. Those cells containing larvæ, sealed over before they had been attacked by the disease, will be slightly darker in appearance than the surrounding brood, and whereas the capping of this is raised, the diseased cells will be found depressed. We must caution the beekeeper not to expose brood too much in spring. For a minute examination a warm day should be chosen, otherwise the brood may become chilled, and in this way form an active medium for the propagation of foul brood. The treatment we should recommend is that by means of camphor, discovered by M. D. Ossipow, a Russian beekeeper of great experience. This remedy, which we have on several occasions alluded to, and which we described in the *British Bee Journal* in 1874, is so simple, and, from reports we have on several occasions alluded to and

which we receive from all parts of Europe, so efficacious, that it must commend itself to all beekeepers. It consists in simply placing one or two pieces of camphor, about the size of a walnut, wrapped up in rag on to the floor board inside the hive. The camphor evaporates slowly and can be renewed when it has entirely disappeared.

Mr. Cheshire, at page 71, states M. Durand directs attention to camphor as yielding admirable results if the diseased brood be removed. There is, however, not the slightest necessity to remove any brood at all, and it is because of its extreme simplicity that this treatment commends itself in preference to such processes as Boutlerow's phenol treatment (lately advocated by Mr. Cheshire,) or the similar treatment by salicylic and fumigation of Hilbert. Mr. Charles Seren, in the January number of the *Bulletin d'Apiculture de la Suisse Romande*, describes how often other remedies had failed, and in a very short time cured with camphor foul brood in hives where breeding was being carried on, and without the removal of any of the brood. To those who have not foul brood, or any signs of it, we should still recommend them the use of camphor as a preventative, or even to do as we do, and never to give bees syrup without the addition of salicylic acid. It has also been recommended by M. Jarie to give bees camphorated syrup; but camphor is not readily dissolved in water, the proportions being one in thirteen, although a little more is desired if the water be kept warm.

There is another remedy which was first introduced by M. Klempin, which also appears very simple, namely, fumigation with common thyme. No special fumigation is required, but an ordinary smoker can be used. The simple herb as grown in the garden is dried, lighted, and the smoker filled with it. The nozzle of the smoker is then placed in the entrance, and the smoke blown into the hive. This is done every evening for eight days to a fortnight without disturbing bees or brood, after which it is said the disease entirely disappears. Both these remedies, either used by themselves or in conjunction with one another, are simple, inexpensive, and easy of application, and we hope beekeepers will give them a fair trial. The camphor remedy has already been before the public for some years, and is so simple in its application that the merest novice can do no harm by its use. We therefore recommend all those who have had foul brood, or suspect foul brood in their districts, to put a lump or two of camphor into their hives at once, and prevent what they might find much more difficult to eradicate if they allowed the disease to attain its full development.—*British Bee Journal*.

A Word from Sweet Home Apiary.

THE long-established Sweet Home Apiary of the pioneer beemaster of Queensland, Mr. J. Carroll, is prettily situated upon one of those wooded hills between Rosalie and One-tree-hill Range. There is a road which leads from Milton, round by Ithaca Creek, and coming out by the Toowong Cemetery, which is one of the prettiest roads for an afternoon or moonlight ride possible, and it is on this road that Mr. Carroll's apiary has now been established for over twenty years. From this spot hives of bees have been sent to every corner of Australia, and Mr. Carroll's name has become a household word among beekeepers.

Riding by the other day, I saw the "veteran" busy in the garden planting a Moreton Bay fig. To dismount and settle down to a chat did not take long. Mr. Carroll informed me that he had not, during this past year, gone so extensively into the pursuit as he used to do; nevertheless, he had sold a great many hives and a large amount of honey, for the season had been a good one for honey. He stated that some Victorian beekeepers, who had visited him last week, were dumfounded at the immense quantity of honey that he showed them in one of his hives. "That one there," he said to me, "with the three stories on. It is useless your stating in print how much I have taken from those bees, because no one will believe it; but you can look for yourself, and you will find that top box as well as the middle one full of almost finished sections, and yet, I assure you, I have taken as much again from them. I will now," he continued, "give you such some advice which you can give to the many new beekeepers there now are. First, tell them that this constant disturbing, hunting to see the queen, and taking out the frames, is radically wrong if you want to produce surplus honey. That hive you have just looked at, I have never disturbed the bottom box or chamber for three years past. That one there (pointing to another box,) small as the brood chamber is—only eight frames—I have never looked at for four years, and yet, you see, it is three stories high, and has yielded almost as much honey as the other. I keep certain hives for increase and queen rearing, and, of course, they are disturbed; but the amateur, who wants honey, to go and tiddlywink every day with the brood chamber is fatal to honey gathering."

The next little bit of experience gathered by the veteran, during twenty years beekeeping in hot Queensland, is the necessity of

shading the hives. "And," he added, "there is no shade equal to that of living trees. You will observe all my best honey gathering hives are under trees, and, besides that, you can see what cool and efficient artificial roofs I put over every hive." This is good advice, for it is apparent to any one that the heat of an unshaded hive must be intense, and the bees cannot and will not work in it, and so they come outside and remain in idle clusters in order to lessen the temperature and the crowd inside, and so prevent their comb from collapsing. In the house I saw piles of sections filled with pure honey, and some beautiful bell-glasses also filled with virgin comb and clear honey, these latter being sold as ornaments to the dining table.—*Queenslander*, 27th March.

CORRESPONDENCE.

(To the Editor of the Beekeepers' Journal.)

SIR,—In his letter for April, Mr. Fullwood says that he has read the reason for my preferring the Berlepsch or Dzierzon style of hive. Now I beg to inform the kind readers (as well as Mr. Fullwood) that I never mentioned any reason for preferring the *Dzierzon* hive, but clearly showed the great difference between the two and my preference for the Berlepsch hive. Mr. Fullwood seems to have the impression that the two hives are much alike, as he says further on that my kind of hive "has been used in all the colonies, and mostly abandoned." If he alludes to the *Dzierzon* hive, he may be right; but he is absolutely wrong should he mean the Berlepsch hive, as having been abandoned. It is only a little over four years since my start here, and it is about two years since my style of hive was made public. Is it possible that my hive would have been used and abandoned, when nobody knew about it? Or is it possible for a person that has read an article or two about this hive, to form a judgment and condemn it, because he has a different hive in use? I am happy to say that my hives find more friends the more they get known; even many of those that had the Langstroth hive first, now work with the Berlepsch, some with over a hundred stocks, and the preference increases the longer they use it.

Mr. Fullwood also finds the facts that bees in their natural state are usually found in trees—where of necessity the height is greater than the width—not conclusive to his mind, for frequently bees build in caves, under shelves of rock, &c. But as every one knows what a rarity it is to find colonies of bees

working in such wide places, which are as numerous as hollow trees, there is not much value in his argument. I am well aware that every beekeeper can cite instances in his own experience or on hearsay of bees taking up their abode in extraordinary places. These are, however, exceptions that prove the rule, and have occurred as matters of necessity to the bees, who certainly would take the alternative of a wide lodging in the place of none at all.

The long shallow frame is an absolute necessity for a hive that opens at the top only, and for this part of necessity it is used in the Langstroth hive. In the Berlepsch hive half-sized brood frames would be and have been used since the invention of the hive; and if now the same method is applied to the Langstroth hive, is that not an imitation, as well as is the division-board in the brood room and the queen excluder-board or zinc between brood and honey-storey?

W. ABRAM,

Manager Italian Bee Company.

Parramatta, N.S.W. 19th June, 1886.

(To the Editor of the Beekeepers' Journal.)

SIR,—Having kept bees on the old plan for years, and now beginning to try the Langstroth or frame hives, I should be glad of some information as to the working of the extractor. Would you or any of your readers inform me how many Langstroth frames could be put through the extractor by one man in one day, he taking them from the supers; or, if necessary to have help, how much the two could accomplish; also, what is the most expeditious way of getting the frames free of bees and ready to extract?

I think I have been fairly successful in getting the sections, but fear the extracting will be too tedious.—I am, &c.,

A SUBSCRIBER.

[Some of our readers who practise extracting on a large scale will no doubt give "Subscriber" the information he asks. It is considered much less trouble working for extracted honey than for comb honey in sections, and in America it pays better to extract and sell at half, or even one-third, the price of section-box honey. Two-storied hives are necessary. Swarming is in a great measure prevented by working for extracted honey, and colonies keep stronger. Of course all extracting must be done indoors, away from the bees, or trouble will result. For expeditious work, Professor Cook, in his manual, recommends the following method:—With a comb box, having a close-fitting cover, go to two or three hives, from each of which take two or three of the best filled combs and

extract them; then go to three other hives, take out full combs, replacing them by those from the first hives, and now extracted. Having extracted the second lot, proceed in the same manner throughout the apiary, and insert the last empty lot of combs into the hives from which you took the first lot. In removing the combs from the hives the bees are all shaken or brushed off the combs on to a broad board in front of the hive, placed so that they can all crawl in. Some beekeepers brush them back into the hive itself; a good strong goose or turkey feather, or any other moderately soft kind of brush, does for brushing bees off combs. If the honey is not all sealed, bees should not be shaken from the combs. The quantity of combs one can get through in a day will very largely depend on the method of proceeding, and the handiness of all arrangements. Uncapping is perhaps the most tedious part of the work; but a good uncapping knife and a little experience soon disposes of that difficulty. Mr. Navau informs us he can manage to extract sixty frames a day by himself with a two-frame extractor.—ED.]

(To the Editors of the Australian Beekeepers' Journal.)

GENTLEMEN,—I am very glad to see that an old friend, "Apis," has entered the lists on the question of the "most suitable frame for a standard," knowing that he is perhaps the most competent man among us to write thereon.

Our Queensland winter has so far been exceptionally mild with more than ordinary rainy weather, and unless we have some sharp night frosts between this and middle of August, we shall have early swarming, say August, and an abundant supply of honey, so that our numerous bee men will need look out for a market.

Although the last season was poor in honey yield, and very little increase in stocks, the market for a time was completely glutted, honey in some cases being unsaleable.

Could a market be found where honey could be disposed of at fair rates, there is scarcely any country so favourably situated as is Queensland for the apiarist. The difficulties are few, the returns enormous, although the heat is sometimes great and gin-case beekeepers occasionally have a melt down. By proper sunshades and ample ventilation (downward) however, no mishap need occur; the greatest trouble being that during the hottest weather the bees largely forsake the inside of the box, and mass on the outside, often covering two or three sides of the boxes night and day. Very few beekeepers give sufficient ventilation, adhering to the miserably

small apertures for entrances that do service in cooler regions.

My bees have been as busy the past few days as though it was already summer, roaming in and out almost before daylight. Having watched the matter of the best workers pretty closely, being somewhat jealous of the reputation of pure "Italians," I have concluded that a first cross between Italian and Black is frequently ahead of pure stock; but, as a rule, the purest bred stock give the best results over all; that is, take any given number of pure stocks, and a similar number of hybrids, in the same locality, on the whole the best results will accrue from the pure stocks.

The results from imported queens are frequently inferior, but the daughters of imported queens mating with pure drones, give the most satisfactory results. I have found many imported queens never fully recover the effects of the long confinement, and remain dull and attenuated, and die off early.

I have found that hybrids degenerate very quickly until they become utterly worthless.

As I have said frequently, first crosses are superior; just now I have two such, that, just as day is breaking, are rushing out as if it were summer, instead of midwinter, whilst most others are quiet, until the sun is well up. Hybrids do not spring dwindle so badly as pure stock.

I see some of your correspondents talk much about queen rearing. Would it not be wise to set to work drone rearing, and get a lot of pure drones on the wing before black stocks are ready, and so get queens early mated with these pure drones? To correct the black nuisance also, Italian beekeepers should always keep a superabundance of drones flying during the breeding season, so as to Italianise all surrounding queens as quickly as possible; it is astonishing how largely this can be done. Certain stocks in every yard should be allowed to rear plenty of drones, but let them be pure. Do not allow impure drones to be raised.

I am convinced a vast improvement is being introduced in keeping the brood frames closer together than hitherto. I have been of opinion for years that our general fault is in having the combs too far apart in the brood-nest. This is well in the upper stories for extracting, but not down below. It may require more care in handling, but brood-nests should not be frequently disturbed.—Yours &c. CHAS. FULLWOOD.

Brisbane, Queensland,
12th July, 1886.

QUERIES AND REPLIES.

REPLIES TO QUERIES.

G. F. *Foul Brood*.—There can be little doubt that you have foul brood in your

hive. A few scattered covered cells, with the viscous foetid remains of the larva or imago, is the sign left in winter of the first seeds of the disease sown during autumn breeding, which if unchecked, will do mischief when warm weather and rapid breeding time returns. The spores are about, and will germinate so soon as the conditions are favourable. Chilled brood dies and either *dries up*, or if the hive be damp, gets mildewed, and unless the colony is very weak the bees will soon clear the remains out of the cells; if the nearly mature bee has died from cold it may be left still sealed, but it dries up in the cell in a very different manner to a bee that has been destroyed by the *bacillus alvei*. Brood and unhatched bees often die when the colony dwindles, and become too weak to attend to all the brood, and the temperature gets too low to keep up their vitality. It is not unusual with weak stocks for the queen to shift her quarters in the hive when the approach of cold weather warns her to limit her laying, and the cluster leaves the combs farthest from her new locality to chance and almost inevitable chilling. Chilled brood we believe more often occurs from this cause than from exposure of brood combs when examining the hive, unless unpardonable carelessness has occurred.

Many apiculturists contend that *chilled brood* is a predisposing cause of foul brood, and others even that the former passes into the latter condition if left in the hive; but if our theory of the disease is correct, this can no more be the case than that a man dead from cold should spread small-pox infection. If chilled brood goes on to foul brood, the *bacillus* germ must have been there before the brood was chilled. To distinguish foul brood from chilled brood in the earliest stages may be difficult without the microscope, but in later stages the former becomes so characteristic that no mistake can be made, although the characteristic foetid odour be not apparent. The discovery of a preventative to this disease would be hailed as marking a most important epoch in bee-culture; for although it is contended that when once we know any disease depends on a specific germ its spread is preventable, we find practically that it is not prevented. The germs of foul brood are so widespread that it appears as inevitable as influenza or typhoid fever in the human subject. The hope, therefore, that we may discover and deal with the first nidus seems still remote. All that is at present known of this bee disease is lamentably little, and we (and we believe all our readers) would be glad to hear that "G. F." had undertaken some investigation in this direction.—Ed.

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THE

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VOL. I.—No. 8.]

AUGUST, 1886.

[PRICE 6D.]

PROCEEDINGS OF BEEKEEPERS' SOCIETIES, &c.

ON THE MANUFACTURE OF COMB- FOUNDATION.

*A paper read by Mr. E. A. Coleman, at the
South Australian Beekeepers' Association,
8th July, 1886.*

"ALTHOUGH most of those present this evening are probably well acquainted with the appearance and advantages of comb-foundation, there may be some who have rather hazy ideas as to the exact meaning of the term, and for their benefit I shall preface what I have to say about its manufacture with a few remarks as to its nature and use.

"Comb-foundation is, or ought to be, composed entirely of wax. Substitutes, such as paraffin, have been tried, with which the pure wax has been more or less adulterated; but although such foundation may be accepted by the bees, it will melt down in the hot weather, involving combs and bees in a general ruin. It consists, then, of a sheet of wax, upon both sides of which are impressions similar to the bottoms of the cells in natural comb—that is, three-sided—and so arranged that each indentation on one side of the sheet forms the raised point in the centre of three similar indentations on the other side—a beautiful arrangement, which is at once the strongest and the most economical, both of space and material, that could be devised.

"These impressions are produced by passing the sheet of wax between accurately engraved rollers, or in some machines by pressing it between engraved plates. The sheets should,

for use in brood frames, contain about enough wax to form the complete comb; and the best foundation is that in which the base of the cell is pressed as thin as possible, and the majority of the wax is placed where it can be at once drawn out by the bees to form the sides of the cell. The chief advantage in the use of foundation lies in the saving of honey, and of time and labour on the part of bees, which may be devoted to the gathering of honey. This is explained by the fact that the secretion by the bees of a pound of wax requires the consumption of a considerable quantity of honey—usually estimated to be at least 15 lbs., so that about 30 lbs. must be consumed to completely fill a hive with comb, while, if supplied with foundation, the combs will usually be completed in much less than half the time, and the yields of honey will be proportionately greater. In a poor season, also, it often happens that bees hived on foundation can obtain enough to maintain themselves, and even to store a little, at a time, when, if they were obliged to build their own combs, they would be barely able to feed themselves, and could raise but little brood.

"By the use of comb-foundation we can ensure perfectly flat and regular combs fastened to the frames all round—points of great consequence where rapidity of handling is desired; and we can also regulate and, if necessary, almost prevent, the production of drones, thus effecting a considerable saving in honey. To raise sixteen drones requires as much brood, and about the same quantity of food and attention, as twenty-five workers, and when raised the majority are useless consumers, instead of productive labourers.

"For brood-combs, foundation having the natural base is preferable, but, in some respects, that with the flat base answers better

for use in section-boxes, as it can be made lighter, and the bees are sure to alter it to the shape and thickness of natural comb.

"Besides the foundation *machine*, the apparatus necessary for its manufacture consists of a dipping-can, one or two vessels in which to keep up a constant supply of melted wax, and two dipping-boards. Each vessel intended to hold the wax should be surrounded by an outer vessel containing water; this is necessary to prevent the wax from burning.

"If Langstroth sheets are required, the dipping-can should not be less than about 18 inches x 3 x 12 or 13 inches deep. This size will hold about 20 lbs. of wax. The dipping-boards should be about 16 inches x 19 inches. They be may about half an inch thick, and should be brought to an edge at each side. We dip them by means of nails, two of which are driven into each edge of the board near the corner, allowing them to project about an inch, so that the board may be reversed without taking hold of the wood itself, which would injure the sheet. The reason for reversing the board is that the wax, when cooling, runs to the lower edge of the board, and sets there about twice as thickly as on the upper part. The number of dips required depends upon the temperature of the wax, which must be regulated to a nicety. When at the right heat four dips will produce a sheet of about five and a-half to six square feet to the pound. If a little too hot, six dips may be required. The thickness of the sheet may also be regulated by the rapidity with which the board is immersed and withdrawn.

"The boards require soaking in water for several hours before using them, to prevent the wax from sticking tightly to them; and they will sometimes require scraping, to remove wax which has soaked into the wood, and to produce a smooth surface. The water in which they must be dipped each time before lowering them into the wax should be quite warm; if not, it will cool the boards too much, and the consequent rapid cooling of the sheets of wax will most likely crack them.

"Having our dipping-can full of melted wax sufficiently cool, and our boards well soaked, we proceed as follows:—Taking hold of the two projecting nails on one edge of the board, we quickly plunge it into the melted wax, and instantly withdrawing it, hold it over the wax until it has ceased to drip, when it is dipped again, receiving a fresh coat of wax, which is, however, much thicker at the lower edge of the board. It is then reversed and dipped twice more in that position, which produces an even sheet all over the board. A blunt knife is then passed round the board to scrape the wax from the edges, and one end of the sheet is loosened, by which time it is sufficiently cool to peel off in one piece. A

sheet is of course obtained from each side of the board, which is then immersed in water and again dipped into the wax. As soon as the wax gets too low it is replenished from the melting cans on the fire, and if the room is not too cold the addition of this hot wax will warm the whole sufficiently to counteract the cooling of that left in the dipping-can.

"The sheets, if placed in a pile, will retain their heat for several hours. When first taken from the boards they are much too soft to be rolled, and if allowed to remain too long they become hard and brittle, when the rollers will cut right through them.

"Soap or starch is used to prevent the sheets from sticking to the rollers. We usually mix some strong soapsuds in a shallow tin large enough to take a whole sheet. The first two or three sheets should be passed completely through the soapy water; but as soon as the rollers become thoroughly wet, it will be found sufficient to dip only a few inches of one end of sheet.

"All that now remains to be done is to cut the foundation to the required size. This is done by placing on the sheet, or a small pile of sheets, a board of the right dimensions, and cutting round it with a keen knife. The board should be edged with tin, to prevent its being cut. Foundation, as usually sold for Langstroth and other frames, is often cut too small. A sheet which comes within one-eighth of an inch of the end and bottom bars of a wired frame will be joined to the wood all round by the bees, forming a comb which completely fills the frame, and which, besides economising space, is much stronger than one hanging mainly from the top bar."

ORIGINAL CONTRIBUTIONS.

Beekeeping for Beginners.

In the Southern parts of Australia bees gather food all the year round (except in the higher regions where snow and frost hold their sway for several weeks in the winter,) so that we find them flying out for water, honey, or pollen on every fine day throughout the winter months. The queen, however, lays eggs very sparingly after March or April until July or August, according to the mildness of the season, when, if all is well and strong in the hive, she will generally rapidly increase the number of eggs in proportion to the strength of the hive, or, in other moods, to the number of bees there are to care for them when they hatch. If, therefore, the season be fair and mild, and his stocks fairly strong and healthy, beginner will find the number of bees begin to increase rapidly by the middle or end of August; by the middle

or end of September, unless it be wet and cold, they will become so numerous as to fill the hive to overflowing, and if left alone will at once make preparations for swarming.

These preparations are as follow:—The queen and bees, finding their home is getting too full, arrange that a large portion of the family shall emigrate to another home; but as no colony can be formed without a queen, they prepare for rearing some. It is done in this way—the bees select some eggs that have been laid three or four days and therefore just hatched into a larva, and commence feeding them with large quantities of specially prepared food, called royal jelly, and immediately commence to enlarge the cell, so as to hold the food and the rapidly growing grubs destined to become queens. Seven days after the eggs are laid the cells are elongated, and then sealed over, when they appear like a little tube of brown wax hanging down from the comb to which it belongs. In these cells, the queens, having abundance of royal food, arrive at maturity at about the fifteenth or sixteenth day after the eggs were laid, and then biting their way out at the bottom of the hanging cell, emerge a fully-developed queen. Now, as it is a law with bees that is very seldom broken, that there shall be only one queen in each hive, the old queen arranges for her departure some seven to nine days before the new queen emerges from their cells, and the first fine day she quits her home with a large proportion of the bees to find new quarters, having all however first filled themselves with honey—in short the hive has *swarmed*. The bees and queen fly out, whirl about in the air for a little while, sending forth a loud humming sound, till very soon the queen, getting tired, settles on some bush, tree, or building not far from her old home; all the rest of the swarm follow her and settle with her, forming a hanging cluster like a large bunch of grapes, or a dense clump of bees, if on a building. As a rule, they will remain in this position often for hours if undisturbed, and sometimes even for a day and night, but occasionally, after a quarter of an hour or so, the queen takes flighting in, and followed by all the swarm, starts off for another locality, often a considerable distance away, and perhaps to some hollow tree, or some building which has been found by some of the bees prior to the swarm coming out. Before telling beginner the way he should deal with swarms, we will return to the hive from which it came, and see what is going on. First we find comparatively few bees left, but a few of these that left with the swarm may return. The combs are full of eggs, grubs and young bees just hatching out, and the family rapidly increases daily. In a

few days, generally six to eight or nine, one of the young queens emerges from her cell, and makes it her first duty to go around the combs looking for other queen cells, which she tears open, killing the inmates, so that she has no rival in the hive. In a few days after, if the weather be fine, she leaves the hive for her wedding tour, and meeting with drones becomes fertilised, returns to the hive, and in a few days more commences laying, so as to maintain and increase the population of the colony. If, however, she fails to destroy all the queen cells, and another queen hatches, a battle royal ensues between the two, which nearly always ends in one of them being stung to death. It is only on such occasions as these that the queens use their stings. It frequently happens, however, especially if the stock is strong, that as soon as a new queen is hatched she takes out a second swarm, which is called a *cast* or *after swarm*. Such swarms are generally much smaller than the first, and usually leave the parent hive very weak. Second swarms are therefore either prevented by advanced beekeepers, or if they issue, are returned to the parent hive in a manner we shall afterwards describe.

CORRESPONDENCE.

THE BERLEPSCH AND LANGSTROTH HIVES COMPARED.

(Continued from page 70.)

(To the Editors of the Beekeepers' Journal.)

GENTLEMEN,—Before proceeding farther, I must correct an error that appeared in my last. When speaking of the surplus boxes of the Langstroth hive, I said:—"I find in the height of the season that I require three or four *full stories* over the brood chamber—never less than three; these give together 4320 inches of comb capacity, as against 646 inches in the Berlepsch surplus box—over seven times the space." I had apparently reckoned the brood or lower box in with the surplus boxes; it should have read—two or three *full stories* over the brood chamber—never less than two; these give together for three, 4320 inches, and for two, 2880 inches, as against 646 inches in the Berlepsch surplus box. There is also another slight error, in which I have allowed eleven frames to the Berlepsch hive instead of ten, thus reckoning a greater comb capacity in the brood chamber of that hive than it really is.

I have shown that, according to the most advanced ideas, the difference in the size and shape of the two hives and their frames is all in favour of the Langstroth; and I shall now

endeavour to show that for convenience of manipulation it is even in a more marked degree superior to the Berlepsch hive. When comparing hives, one of the chief considerations is, which gives the best facilities for manipulation. Given two hives equal in all other respects, the one that will allow of getting most rapidly and easily to any part of it will be by far the most valuable of the two. Another very important feature is, that each and every movable part shall be so arranged that they can be moved with care and without jarring the hive. Let us now see which of the two under consideration is the best in these respects. Supposing we have a Langstroth hive with a super on, well stocked with bees, and we wish to examine the frames in the centre of the super; with a simplicity comb holder with us to hook on the side of the hive, we lift off the cover and mat, and after blowing a few puffs of smoke down between the frames, we move two a little to make room to take one out altogether,—hanging it on the comb holder,—which gives ample room for taking out any one we wish. If we require to take some of them away, the bees can be shaken or brushed off *right into* the hive, and other frames substituted at once. To do all this, only *one* frame has to be removed from the hive to make room, and the whole operation can be performed in a minute or two. To get at the brood chamber, we certainly have to remove the super, but this can be done in a few seconds, and if placed on a bottom board alongside, and the cover put on, scarcely a bee will leave it. We then have the whole of the frames in view, as in the former case, and can get at anyone in the same manner. How is it with the Berlepsch hive? After opening the back and removing the glass division, if any of the frames beyond the first are wanted, all the intervening ones must be removed and be kept *out of the hive* till we get them, so that whenever the farthest one is required, all have to be removed—a feature so objectionable as at once to place the hive far below the Langstroth in value. Then, with regard to the arrangements for suspending the frames. All know how prone the bees are to propolise every joint and crevice after the honey season, and how secure they can fasten the ends of the frames to the rabbets where no tin supports are used. We also know that they (especially Italians) “bridge” the combs, and the deeper the frame the more bridges or connections will be made, so that on first opening hives in spring there is always more or less trouble in clearing away the propolis, and cutting away the bridges of wax before we have the frames ready for manipulating. Now, in the Langstroth, we make special provision to prevent the ends of the frames being fastened, by putting tin

supports above the rabbets, that they may rest on a knife edge of tin which effectually prevents propolis. Then, again, by having the whole top surface of the frames clear, we can easily remove all obstructions of this kind, should there be any, and run a knife down between any two frames to cut away the bridges without jarring the hive in any way. Not so with the Berlepsch hive, for with the projecting ends of the frames running in grooves, there is every facility given to the bees to fasten them as securely as a joiner fastens the joints of a piece of cabinet work with glue, in fact, no better device could have been invented for the purpose. How is it possible to remove the propolis and cut the bridges of wax? It must be remembered that there is a permanent horizontal partition only a quarter of an inch above the frames, and the ends of the latter are but a quarter of an inch from the sides of the hive. I must confess that I cannot see any way out of the difficulty, except by getting hold of the spacing nails, or the bottoms of the frames, and tugging at them; running the risk of breaking both frames and combs. Then imagine what a difficult task it must be to get to the innermost frames, where one has to cramp one's arms to get them nearly up to the elbows in a box but $9\frac{1}{4}$ inches wide; the bees on the sides of the box would have rather a hard time of it, and also the operator with various bees. At all events, it is difficult to conceive how a person can make satisfactory headway in manipulating such hives. When brushing the bees off a frame, they *must* of necessity fall outside the hive, so that there is a great risk of losing young bees or even the queen; and unless much time is spent getting the bees into the hive again before closing the back, a lot will be left crawling and lingering about.

Mr. Abram tries to make out that queens can be found more readily in his hives. I hold he is wrong, and on his own showing. He knows as well as I can tell him, that a queen, if she moves at all while we are looking for her, will *always* run from the light. Now, the first frame in the Berlepsch hive intercepts nearly all the light entering it, consequently the queen will run further into the hive as each frame is removed for inspection; whereas in the Langstroth, with the cover and mat removed, the light plays equally into all parts, leaving no dark corners for the queen to run to, so that I consider his argument utterly fails on this point. Mr. Abram also tries to make a point of the glass division or back, telling us that, by looking through it at the first frames, you can judge what some of the others are like, as regards honey. I think this is sheer nonsense; what can be seen? Why, one side of one comb. As well may he tell us that, by looking through

the kitchen window of a large house, and noting the contents of the room, we can tell what furniture there is in any part of the house.

The bee-shed I consider as antiquated as many features of the hive, and one of the remnants of old-fashioned beekeeping, being nothing but an expensive and worse than needless arrangement. I well remember, in my inexperienced days, keeping hives in a bee-shed, a thoroughly well-built one, but no matter how carefully I worked at any one hive, I always succeeded in jarring all the rest, till the inmates became furious. I used at last, to make things more pleasant, to smoke all the bees before I began manipulating one.

I would enumerate many other objections, too, and unfavourable features in the Berlepsch hive; and although I do not think we have arrived at perfection in the Langstroth, I think I have so far shown it to be in every respect much superior to the Berlepsch hive.

APIS.

New Zealand, 15th July, 1886.

THE LANGSTROTH AND BERLEPSCH HIVES COMPARED.

(To the Editors of the *Australian Beekeepers' Journal*.)

GENTLEMEN,—To the letter in your issue for May/June of above heading, and signed by "Apis," I desire to make some remarks in reply.

In the first place, "Apis" undertakes the task of comparing the Langstroth and Berlepsch hives, and all through his letter shows that, practically, he has not the slightest idea of the working of the latter. He has not worked them side by side with the former; he has no practical knowledge thereof whatever. The kind reader may form a judgment of his own whether it is possible or fair to compare and condemn an article of which he has no knowledge.

"Apis" thinks my argument has been unhappily chosen, viz., that while bees in their wild state, in trees, &c., select a place for their home which is higher than wide, the nearer we approach their natural habits the more likely are our arrangements to be successful; and continuing, he admits that in their wild state bees do select trees which are higher than wide, not because it is in accordance with their nature, but because the hollow trees are of such a shape, and says: "Being found in such hollows no more proves that the bees have selected such places on account of their shape, than when a swarm takes possession of the roof of a cottage proves that

the place was selected because of its width or on account of the rafters or shingles overhead." Considering his statement, it makes the impression on me as if he intended to make one believe that there are just as many swarms found under the roofs of cottages as in the hollow trees. If this were so, my argument would have lost half of its correctness. Now, as everyone knows what a real rarity it is to find a colony of bees working under a roof or in other such wide places which are as numerous as hollow trees, there is not much value in his argument. I am well aware that every beekeeper can cite instances, in his own experience or on hearsay, of bees taking up their permanent abode in extraordinary places. These are, however, exceptions that prove the rule, and have occurred as matters of necessity to the bees, who certainly would take the alternative of a wide lodging in place of none at all. Further, he says: "The nearer we let the bees approach their natural habits in our management of them, the more unprofitable will they become," which statement includes that the Langstroth hive is not in accordance with the natural habits of the bees. But it does not follow that a hive which is according to the nature of the bees could not be managed as profitably as the other. And if we check our bees from swarming, raise queens and make artificial swarms—but never out of season—when we wish, what else is that than assisting them in their natural habits? Their greatest desire is to gather honey. Nature has provided them for that purpose, and the bee-master has to manage them accordingly. If he does the contrary, a failure will be the consequence. What "Apis" thinks management against the nature of the bees, is in reality assisting them. To find out their natural habits, to assist and improve therein, that is advanced bee-culture, that is scientific and modern bee-keeping. This style of management, with two and three stories, resembles the old method, when the full combs could not easily be removed at any time, and when the extractor was not known. If anyone wants to rear pure queens of a certain race of bees, and kill the hybridised queens to rear others again in the hope of being more successful each time, does he kill them and rear others in order to work against the natural habits of the bees? or is it the nature of the race to hybridise? Certainly not. The queen-breeder only insists then in keeping their race pure; or if a hive is strong, and every cell full of honey or brood, but no swarm is despatched, and we divide that hive, that is, we make an artificial swarm in the right time, is that against the natural habits of the bees? Do we not assist them by giving more room for

the bees to work and store more honey? What would it lead to should the beginner follow "Apis'" advice and work his bees contrary to their natural habits!

The long shallow frame is an absolute necessity for a hive that opens at the top only, and it is used in the Langstroth hive, as "Apis" has shown. He also states that it is more easily manipulated, with less risk of injuring bees, queens or queen cells, thus admitting that there is risk by lifting the frames out, and if the frames were taller the risk would be greater. He finds the brood-room of the Langstroth hive quite small enough, and would not advise the use of a smaller one, which is proof to me that he keeps the black and hybrid bees, which are more for swarming and breeding even in the honey season. If he had the young Italians, in the first season he would find that even the brood chamber in a Berlepsch hive is large enough for the extent of their brood. I keep the Italian bees only. That a single half-story surplus part of the Langstroth hive is not sufficient, only shows that taking its honey is not an easy matter, or why should a practical beekeeper require two or three stories as long as he can take the full combs away with ease, and since he has the useful extractor? Two stories give room for nearly 150lbs. of honey, three stories for over 200lbs., and as the broodroom is not altogether used for brood, there is room for at least 50lbs. of honey; thus a two-story hive gives room for about 200lbs., a three-story hive for about 300lbs. of honey. Now every practical beekeeper knows that even in the sunny Australia the average yield of honey from each hive in a season is about 100 to 150lbs., and if this is the result, every reasonable beekeeper ought to be satisfied; therefore I could not see why there should be room provided for 50 to 150lbs. more, which would not be gathered. Moreover, it is not at all wise to leave all the honey in the hive till the end of the season as long as the full comb can be removed and extracted. Or, would "Apis" make beginners believe that he has to empty his two or three stories several times in a season, so that his yield of honey must be about 1000lbs. a hive average? It is also proved that, if the weather is suitable for the increase of brood, and a colony has the desire to swarm, no extent of room will prevent them from so doing; they will swarm and leave (even if ten stories were put one over the other) emptiness.

The bees in my hives breed very fast in spring, but decrease their brood as soon as plenty of honey is to be gathered, thus filling the four or five frames near the door from top to bottom with honey, then they ascend in the honey chamber. When the latter is nearly

built out with comb, I take the full frames from the brood-room and replace empty ones instead. As soon as the bees have nearly all the honey-chamber built with comb, they go on filling them, and when they commence sealing the outside of the last comb, I take the inside ones away and place the last one in first, thus leaving them a start. Sections are worked the same. When the honey-room is nearly built out again, I empty once more the brood-room, then again the honey-room, and so on, until the season is over. The sections do not become dark, not being too long in the hive; and the honey for extracting is not as tough as it would be, had it to remain in the hive till the end of the season. From the brood-room I take each time 25 to 30lbs., and the same from the honey-room. I hope the beginner, as well as the experienced beekeeper, will clearly understand that such a method of management is superior to the one indicated by "Apis."

That my conclusion in preferring the Berlepsch hive is not without foundation, is in one particular at least proved by "Propolis," who says that Mr. Carroll sends bees, all the frames being *screwed down*, to prevent moving, killing bees, &c. In the Berlepsch no such screwing down the frames is necessary, for they travel safely without; and again, under "Useful Hints" article, "Frame Spacing," in No. 6, the value of frame spacing is shown. This frame spacing is provided and indeed invented with the Berlepsch hive and frame. It is only an imitation in the Langstroth hive, and will never answer as well as the Berlepsch hive.

W. ABRAM,

Manager Italian Bee Company,
Parramatta, N.S.W., 8th July, 1886.

THE BERLEPSCH HIVE.

(To the Editor of the *Beekeepers' Journal*.)

MR. EDITOR,—I think there is a little misunderstanding existing between Mr. Abram and Mr. Chas. Fullwood, and, as I think I am able to clear away this, I should like to say a little on this subject. A few years ago, one of the reporters of the *Leader* visited my apiary, and when he saw my hives he said that my hives were all wrong, and he stated that Mr. Abram's Berlepsch hives were far superior. As I never before had seen a Berlepsch hive, I asked him if he would get me one of these hives from Mr. Abram. He replied in the affirmative, and not long after I received one of these hives from Mr. Abram, made of Californian pine. When I saw it at first, I at once concluded it would not do as well for me for several reasons. One reason is this, its very construction indicates that it cannot stand outside in a garden without a covering in a Victorian winter. We had now for two weeks

rain almost without intermission, but I would not be satisfied with my own opinion without giving it a trial. It remained in my shop the greater part of the season, until one day a very fine natural swarm issued, and no hive being available, I hived it into the Berlepsch hive, and in some respects the said hive pleased me very much. In regard to wintering pure Italians during a wet Victorian winter, the Berlepsch hive cannot be surpassed. I believe it is owing to the super being so connected with the broodroom that no outer air can enter, and yet the steam from the bees has ample room to escape, and the bees do not contract the diarrhoea. But yet there are other reasons why I dislike it. One reason is that my extractor is of Mr. Root's "Novice," and the Berlepsch frames do not fit into the wire basket. But as I wanted the frames extracted last season, I had to fix separate top bars on to the Berlepsch frames, on which I could hang those frames on to the basket of the Langstroth extractor. Of course I did it, but with a great loss of time, which is a great consideration in that season of the year. Another reason that I did not want it is, that the bees fill up the grooves, in which the projecting ends of the frames are moving, so full of propolis, that at times, especially in cold days, it is almost impossible to move the frames without breaking them. Further, I find that the bees now and then build the comb not quite straight down, and the combs become fixed to each other. As the super was filled with beautiful comb honey, I could dispose of it, but not so readily as the one pound sections from the Langstroth hive. I had made up my mind that three weeks after the first swarm issued from it, I would transfer it into a Langstroth hive, but as the season was good, at that time it was so full of beautiful honey that I had to extract it and transfer it at once. Although I said above that I had not seen a Berlepsch hive before, yet the first frame I used about ten years ago was, although not the same dimension, on the same principle, namely, the frame ends running in a groove, and upon the back of the hive, and I think it is this kind of hive Mr. Pullen is alluding to.

H. NAVEAU.

Hamilton, 18th August, 1886.

NEW BOOKS, REVIEWS AND EXTRACTS FROM FOREIGN JOURNALS.

ARTIFICIAL SWARMING.

When fertile queens can be obtained at reasonable price, the following plan of dividing is, perhaps, the most objectionable and the most profitable, when increase

with a fair amount of surplus honey is desired. Let A be the hive it is proposed to divide. About mid day, when the bees are flying, remove from A one frame of brood, with the queen, and place it in the centre of a new hive B, filling up both with frames of foundation or empty reserved combs, or both. Place B upon the stand of A. Take combs from A, and shake into B about half the bees from A, returning the combs to their places in A. (Age under a pipe cover edge, in the centre of A, the new and fertile queen, and close up the frames, removing A to a new stand. On the following morning the queen may be released, and in a good season both hives may be worked for extracted or comb honey with fair prospect of success, provided the division be made sufficiently early, say not later than the first week in June. This system must only be applied to hives with large population and abundance of brood—*British Bee Journal*.

BEEKEEPING IN MINORCA.

You ask me how the natives keep bees. I think our bees keep themselves. Very little care is bestowed upon them by the so-called beekeepers. Their hives are composed of a long cylinder made of split reeds, with round stone loadings an inch thick at either end. These cylinders—about a foot across and five long—are placed on a slanting stone rack, with a few shavings on top of each. Some dozen hives are thus put close together with front entrances sloping downwards, generally among the prickly pear bushes, where nothing more useful can be made to grow. The first stone heading has nine or ten holes bored through it for the bees to go in and out. These are then laid over the whole to keep off the rain, and their apertures are completed.

One or two, even the so-called beekeeper, who is generally an ignorant rustic, looks into his hives in order to try and get a little honey he may find there. But the fiercest bees and the most voracious and enterprising were ever known to find honey. In our hives we state the north make and have among these all kinds of bees. On such occasions our beekeeper concludes his bees have made the mistake of laying their winter eggs instead of brood. He considers this the only possible way of accounting for such ruin as he finds within the hives. Occasionally he comes across a little of our excellent Minorcan honey, and this is the way he goes to work to get it out.

About the middle or end of June he takes away the top of the cylinder, and then takes that long, having a flat, sharp-pointed edge at one end and a hook at the other, and after working heavily he goes to work cutting away and pulling out the combs—brood and all—which

so irritates the poor bees that sometimes he has to flee for his life. The hives being set close together—touching each other in fact—your reader can easily imagine the confusion that ensues. Sometimes the bees take to robbing; but the fellow has no idea of the cause of his difficulties, thinking they get up a fight from pure “cussedness”—and yet our young bees are as gentle as flies. I asked the man who sold me my two swarms how much honey he gathered from them all. He answered that sometimes he got a little and sometimes none at all. One or two *arrobas*, or at most a hundredweight, is considered good luck, even when you are the unhappy owner of forty of these hives, as was the case with my man. This would be at most $2\frac{1}{2}$ pounds per hive. And yet these ignoramuses laugh innocently at us, good-naturedly, for keeping our bees in such a new-fangled way. *Per contra* the sulphur pit is unknown here, a fact which speaks in their favour.

Formerly the nectar was more abundant than at present, many having given up in disgust, as well they may. If we can get the people to use modern methods, we may have great hopes for the future, for, as you must be aware, our honey is only rivalled by that of Mount Hymettus; and your George Armstrong tells us, in his *History of Minorca*, published in 1750, when he was Military Governor of the Island, that owing to the great abundance of aromatic herbs, our honey is unsurpassed. Considerable quantities of the nectar were at that time exported to England *via* Gibraltar.

Now as to our race of bees. I am informed it is unknown in England; but they must be of a superior kind, for they work and breed tremendously, and not only do they wear the three classic gold bands, but when ventilating they put out a fourth and thicker line on their posteriors, which occasionally resembles a triangle in shape. And they wear grey jackets that are golden in the sun, when seen through a magnifying glass.

I regret I am unable to ascertain whether our bees really gather pollen from *Olemtis Vitalba*, it having ceased to bloom. But as in November and December I knew of no flowers then blossoming bearing white pollen, I concluded it came from *Vitalba*, which they visited extensively. Shall look into the matter next season.

Our almond trees are again in blossom, and a pretty sight it is to see in winter, mid-winter trees in full bloom with not a green leaf visible. I can only compare it to our trees in America after a snowstorm. The crop will be short, owing to a succession of gales from the north.

I see that the Rev Mr. Strond writes from Africa that he has hives with three and four

queens working harmoniously. How is this to be understood?

In looking over my populous hive, I found the inner blanket, which was thickly enamelled with propolis, pretty badly eaten up. Is it the bees? Also a place on it near the entrance quite mouldy like. Did the bees want ventilation? I have since found the wool thus gnawed from the blanket under the hive entrance, together with two or three large larvae, and therefore conclude the bees did it to get rid of their enemy, the moth-worm.—*F. C. Andrews, Minorca, in British Bee Journal.*

THE KOHLER PROCESS.

As we are often asked for an explanation of this method, we give it concisely below. It is a method of procuring the fecundation of young queens by selected drones, and, therefore, of breeding any race of bees—as Italians, or Syrians, for instance—pure, and was first practised by Herr Kohler, a noted German apiarist, whose name it bears:—When a young queen is hatched out in a nucleus-box (or in any other hive) pure drones of her own race are selected and confined with her in the same box for two or three days. Then on the afternoon of a fine day, when all other drones in the apiary have gone to rest, and the queen is judged ready to take her wedding flight, the hive is opened. As might be expected, the queen and her companions immediately avail themselves of their liberty and a pure breed is secured. Should the first tour prove unsuccessful, the hive is again shut up and not opened until the following afternoon. The closed hive should be removed to a dark and cool room, while the bees are under confinement, and removed to its accustomed stand before the bees are set at liberty. Feeding with a little warm syrup before the flight takes place will expedite the process. Baron von Berlepsch, writing of this method in the year 1867—when it was first introduced—says: “I have tested the discovery at six different times, and on every occasion it has proved successful.” With ourselves it has rarely failed. Sufficient ventilation must be afforded to the hive while the bees are confined, or serious consequences may ensue. Since the Baron’s time, most prominent apiarists have proved and approved this method.—*British Bee Journal*, 27th May, 1886.

SMOKING SWARMS.

On more than one occasion we have known swarms to be destroyed by injecting smoke. The novice, anxious to see “how the swarm is getting on,” armed with his smoker, in fear of stings, injects puff after puff into the newly-hived swarm, on the second or third day’s

occupation of its new domicile, forgetful that the honey-sac of every bee is gorged, and the small amount of comb built most fragile; when, as a natural consequence, the poor bees, alarmed and excited, disgorge their honey, the whole population becomes a clammy mass, and perishes in the midst of its fallen combs. We are cognisant of cases where smoke has been administered to a swarm, with the view of quieting it, before despatching it by railway, or otherwise, to a friend or purchaser, and the swarm on its arrival has been found deficient from the above-named results. Since our "Hints" are intended to warn the inexperienced against "how not to do it," as well as to teach them "how to do it," let such make a note never to use smoke, carbolic acid, or other "intimidant," in the case of swarms. Indeed, during the summer months, while the honey flow is on, it is best to dispense with all irritants and intimidants whatever, and simply to manipulate with "quietness and confidence," whenever manipulation is necessary. We must, however, except such operations as removing super, or introducing a queen.—*British Bee Journal*, 27th May, 1886.

STINGS AND GLOVES.

I AM quite pleased to see "A Cottager's" experience, which quite agrees with mine. I have stocks which are quite a pleasure to work with, others which at times are ungovernable (and these latter are the ones, by the way, which led me to abandon the smoker,—when they are at their worst it is of no use, when at their best it is not needed.) Now given these two facts, irritable bees and the pain and inconvenience of stings, why should gloves not be worn? Granted that they are clumsy—one gets accustomed to work with them, and as for their causing loss of bee life, I don't admit this. If I manipulate carefully, it is not often that a bee leaves its sting in my gloves, but should it try, give it time and it will usually withdraw its sting by a rotatory motion, except it be one that is determined on death, when it stretches itself flat on its chest in intense anger and draws itself away from its sting. But this would occur just the same on the bare skin! Again, I have often seen bees prick the gloves slightly with the sting and repeatedly, till a vulnerable part was reached—say the wrist when the under gloves are too short—and then to go the sting deeply. In this case the gloves I should say prevented the destruction of the bee.

With all deference to those that are bee-proof, I must still conclude that if I were compelled to manipulate my hybrids without gloves or veil, I should prefer to place myself on the retired list of beekeepers. While on the subject of stings, I have observed two

things not so far as I know mentioned. First, that after the sting has become separated from the bee, it continues to eject the poison by intermittent and visible contractions of the poison-sac; second, if the more tip of the newly detached sting be slightly inserted in the skin the motions of the sting cause it to penetrate more deeply. Can anyone inform me by experience whether india-rubber gloves are efficacious or not? They would be less clumsy.—*British Bee Journal*, 20th May, 1886.

HOW TO TAKE A SWARM.

IT is one of the first rules of beekeeping to have everything ready before it is actually wanted, for there are so many events which occur suddenly or unexpectedly with bees, that there is no time to look about for things when these occasions arise. Swarming is one of these events, and a swarm of bees must be looked after without delay, if our beginner does not wish them to abscond. Therefore early in spring the beekeeper should get one spare live at least ready for every stock he has, and he should also arrange where he will place any swarms he may get; let him also have a box or clean bucket or a close-woven basket for taking the swarm in. Many who use ordinary boxes for hives take the swarm direct into the box they will occupy permanently; but it will sometimes be found more convenient to first take them in a small box or basket, and afterwards get them into the proper hive. It is well also to have a small sheet of calico or old canvas, an old tablecloth or small sheet will do well, a goose wing or large soft brush, and a watering can with water. The exact mode of proceeding will depend upon how and where the swarm has settled, for they will sometimes settle in very awkward places. Most often, however, the first swarms alight on some low bush or small tree near the hives. Although bees seldom sting during swarming, unless hurt, the beginner will probably have more confidence if he is protected by a bee veil and gloves, for it is important that there should be no nervousness, uncertainty, or hurried roughness in taking a swarm. As soon as the bees have all settled and clustered pretty closely, hanging in a large bunch from a branch or bush, hold your box or basket carefully under it with one hand, and, if possible, in such a way as to partially enclose the swarm, with the other hand give the branch or bush a sharp shake until nearly all the bees are dislodged into the box. If the box is one you intend to keep the bees in permanently, spread your sheet of calico on the ground, near to where they had settled, and gently place the box and swarm on it, propping up one edge of the box with a stone or piece of wood. The bees will soon settle themselves in the

box, and those flying about the place on which the swarm clustered will soon join those in the box, and in the evening the hive can be carefully moved to its permanent place. If the swarm settles on the ground, or close to it, the box can be either placed over them and propped up by pieces of wood or stone, when they will soon take possession and crawl up into the box. If they are spread about, a little sprinkling from the watering pot or garden syringe will soon make them gather closer together, and a little artificial shower of this kind generally hastens their "run for shelter." Sometimes a swarm will be partly on a low bush and partly on the ground, in which case lay down your sheet close up to and as much under the swarm as possible; place your box or hive on the cloth with one side propped up, and as close to the cluster as you can, and shake as many as possible on to the cloth in front of the propped-up hive; as a rule they will quickly make for the box and settle in it. It must be a rule never to leave swarms long exposed to the hot rays of the sun, and even when they have settled in the hive it should be shaded by boards or something of the kind, till it is moved in the evening. If the swarm has settled on a fence, trunk of a tree, or a wall, or under a verandah, or roof of a building, as they sometimes will, they must be brushed off into the box or hive, with a goose wing or brush. Do this gently and not too hurriedly, and avoid any quick movements; when hived, the box may be placed on the calico sheet close at hand as before.

Sometimes they will settle high up in a tree, in which case a ladder will probably be required, and it may be even necessary to quietly saw off a branch on which a swarm settles, so it may be lowered down for hiving. A little thought and ingenuity will generally enable beginner to secure a swarm from almost any position it may have selected, if he keeps in view the precautions already referred to.

As a rule, hive swarms as quickly after settling as possible, and shade them from the sun—if they are taken in the hive they are to remain in, they can be moved to their permanent position, as soon as they are all quietly settled, or left till the evening before doing so; if, however, they are taken in a box or basket, to be afterwards put into their hive, immediately they have fairly settled in the box or basket take them to their new hive, which must be propped up, and the calico sheet placed so that when shaken out of the swarm box they can easily find and run into their permanent home. Swarms will sometimes rise again if everything is not to their liking, or if they are much disturbed; it is a golden rule, therefore, in taking and hiving swarms, to disturb them as little as possible after they have once settled down, and

never attempt to move them from one box to another after they have been quiet for an hour or two, or they will very probably abscond from so unskilled a master.

HONEY AS AN ARTICLE OF FOOD.

BY THOMAS NEWMAN.

PLINY speaks of Rutilius Pollo, who possessed marvellous health and strength, at over 100 years of age. Upon being presented to the Emperor Augustus, who inquired the secret of his liveliness of spirits and strength of body at so great an age, he answered: "Internus melle; externus oleo"—Internally through honey; externally through oil.

Among all the myriads of insects, there certainly is none, the product of whose industry is more pleasant and tempting to the palate, more nutritious and health-giving to the body, or more valuable as an article of commerce, than the product of the bee—delicious and immaculately pure honey. How astonishingly appropriate is even its name—Honey! Derived from the Hebrew word *ghaney*, literally it means "Delight." Humanity may, therefore, delight itself with honey, as long as the sun endureth! Its early history shows that it was for ages man's principal source of nourishment; and, wherever civilisation extended its way, the "little busy bee" was carried as its companion and co-worker in the cause of elevation and refinement. Why, then, did honey lose its honoured place as an article of food? The introduction of sugar gave it its first blow; its use became general in the seventeenth century, and as its use increased, the use of honey decreased, until at length the bee masters' guild was established, and the skill and experience of the old bee masters were lost.

The introduction of the vile compounds known as "Table Syrup," with their impurities and adulterations, has had the effect of opening the eyes of consumers, and of re-opening for honey its God-given place as an article of food. Instead of dealing disease and death promiscuously to those who indulge in its use, as do these syrups, honey gives mankind, in the most agreeable manner, both food and medicine. It is a common expression that honey is a luxury, having nothing to do with the life-giving principle. This is an error; honey is food in one of its most concentrated forms. True, it does not add so much to the growth of muscle as does beef steak, but it does impart other properties, no less necessary to health and vigorous and intellectual action! It gives warmth to the system, arouses nervous energy, and gives vigour to all the vital functions. To the labourer, it gives strength; to the business man, mental force. Its effects are not like

ordinary stimulants, such as spirits, &c., but it produces a healthy action, the results of which are pleasing and permanent—a sweet disposition and a bright intellect.

The use of honey instead of sugar for almost every kind of cooking, is as pleasant for the palate as it is healthy for the stomach. In preparing blackberry, raspberry, or strawberry shortcake it is infinitely superior. Pure honey should always be freely used in every family. Honey eaten upon wheat bread is very beneficial to health. Children would rather eat bread and honey than bread and butter; one pound of honey will reach as far as two pounds of butter, and has, besides, the advantage that it is far more healthy and pleasant tasted, and always remains good, while butter soon becomes rancid, and often produces cramp in the stomach, eructations, sourness, vomiting, and diarrhoea. Well-purified honey has the quality of preserving, for a long time in a fresh state, anything that may be laid in it or mixed with it, and to prevent its corrupting in a far superior manner to sugar. Thus, many species of fruit may be preserved by being laid in honey, and by this means will obtain a pleasant taste, and give to the stomach a healthy tone. One who has once tried it will not use sugar for preserving fruit.

In fact honey may replace sugar as an ingredient in the cooking of almost any article of food, and at the same time greatly add to its relish.

Digestion (all-potent in its effects on the mind as well as the body) depends largely on the food. Poor food received into a poor stomach is the cause of many unhappy homes, while good, healthy food, received into a healthy stomach, becomes "an Angel of Peace" to many a household.

The following are a few recipes:—

Honey Lemon Cake—One cup of butter, two cups of honey, four eggs well beaten, teaspoonful essence of lemon, half cup sour milk, teaspoonful of soda, flour enough to make it as stiff as can well be stirred; bake at once in a quick oven.

Muth's Honey Cakes—One gallon of honey, (dark honey is best), fifteen eggs, three pounds of sugar (a little more honey in its place may be better,) one and a-half ounces of baking soda, two ounces of lard, two pounds of almonds (chopped up), two pounds of citron, four ounces of cinnamon, two ounces of cloves, two ounces of mace, eighteen pounds of flour. Let the honey come almost to a boil; then let it cool off again and add the ingredients; cut out and bake. The cakes are used afterwards with sugar and two whites of eggs.

Honey Fruit Cake—Four eggs, five cups of flour, two cups of honey, one teaspoonful of butter, one cup of sweet milk, two teaspoonfuls of cream of tartar, one teaspoonful soda, one pound

raisins, one pound currants, half-a-pound citron, one teaspoonful each cloves, cinnamon, and nutmeg; bake in a large loaf in a small oven. This will be nice months after baking.

Honey Sponge Cake—One large coffee cupful of honey, one cup of flour, five eggs. Beat yolks and honey together, stirring as little as possible; flavour with lemon juice or extract.

Railroad Honey Cake—One cup of honey, one heaping cup of flour, one teaspoonful of cream of tartar, half teaspoonful soda, three eggs and a little lemon juice; stir all together ten minutes. Bake twenty minutes in a quick oven.

Honey Cakes.—Three cups of honey, four cups sour milk, half cup butter, soda to sweeten the milk; mix rather stiff.

Honey Ginger Snaps.—One pint of honey, three-quarters of a pound of butter, two teaspoonfuls of ginger; boil together a few minutes and when nearly cold put in flour until it is stiff, roll out thinly and bake quickly.

Honey Preserves.—All kinds of fruit made into jam, with honey instead of sugar, are nice. "Butter" made with extracted honey, is much nicer than when made with sugar. For grapes, pick from the stem and pack into a jar until it is full, then turn cold extracted honey over them until they are covered well. Seal up without any heat, and keep in a cool place. After a few months they will be found to be delicious.

Notes on the Habits of Ants.

I.—METHODS OF INVESTIGATION.

WITNESS the study of ants and their ways is especially interesting, it has the advantage that, in order to pursue it successfully, no very great amount of technical knowledge is required. It is certain to afford considerable pleasure, even to the beginner who knows nothing whatever of the nomenclature made use of by savans. The experiments necessary to be tried may be carried on with the simplest appliances, and are almost certain to develop unexpected results.

My own recent researches have been carried on in a district situate about 130 miles from Melbourne. The geology of the locality is varied; three different kinds of strata being met with in a walk of about five miles. A range of trap rocks ran meridionally for about forty miles. These probably indicate a fissure, through which they have been protruded, and an enormous downfall or uprise; since, although the surface level is nearly the same on both sides the range, the rocks to the eastward are upper, and to the westward lower—marked. A little to the north, too, the Murray terraces commences. In relation to this matter, since it would appear as if the geological features, by varying the nature of the

subsoil, tend in no small degree to determine what species of ant shall be met with in any given locality. Ants plentiful where the silurian strata abound are not represented above the trappean rocks; while still fresh varieties abound where the tertiaries commence.

The district examined had an area of about five miles radius, but of this space scarcely more than a quadrant was carefully explored. Yet my finds numbered nearly forty well-defined species. What is strange, too, since my return to Melbourne I have examined the collection at the University, to find that it did not contain half-a-dozen of the species I had myself met with. This fact will be sufficient to show the rich harvest awaiting the labours of anyone who will only take the trouble to carefully explore almost any given space of country in which he may be located.

Two methods of observation are open to the investigator. The ants may be conveniently kept in artificial formicaries; or many of the experiments may be tried with them while they still remain in their natural nests.

Almost any form of clear glass vessel may be used in the former instance. A glass salt jar answers admirably. Sir John Lubbock constructs shallow cells, consisting of two pieces of window glass, about ten inches square, and at a distance apart of from one-tenth to a quarter of an inch (in fact, just sufficiently deep to allow the ants freedom of motion,) with slips of wood round the edges, the intermediate space being filled up with fine sand. These glass nests were either kept in shallow boxes with loose glass covers, resting on baize, which admitted enough air, and yet was impervious to the ants; or on stands either surrounded by water, or by fur, with the hairs pointing downwards.

A very convenient formicarium may be constructed by nailing or screwing three pieces of wood together, as in the sketch; slips of thin wood are affixed by small brass tacks, the edges slightly overlapping inwards. Plates of glass are then inserted, and are kept in position by the outward pressure of the earth. A number of these may be placed on the same stand, which consists of a thick slab of wood, resting on four feet, and having a rabbit cut around it. A rim of brass or tin is then fixed to the edge, the joints being made water-tight with white lead. By exercising a little taste, such a formicarium might be placed even in a drawing room.

Experiments with natural nests may be made with a view of discovering the nature of ant food, their behaviour towards other species and strangers to the community, their method of swarming, whether they are pugnacious or the reverse, if they construct roads, &c. The interior arrangement of the colony may be

generally investigated with the larger species by dividing the nest in half and removing one portion. The galleries, chambers, &c., will then be left bare and become plainly visible. The Rev. Mr. Wood divided a nest into two parts by sawing down a plate of thick glass. This was left in position until the ants had repaired damages, when the earth was carefully removed on one side leaving the galleries to be plainly seen through the glass on the other.

In pursuing my own investigations, I have adopted a very simple plan which has proved eminently successful. Many of the species with which I had to deal were very small. They have, too, a habit of concealing their nests as much as possible. My custom, therefore, was to go round just after a shower, when the ants of nearly all species are bringing out fresh earth. This betrayed the presence of the nests. I then placed a piece of glass over the entrance, on that a piece of cloth, and on that, brick, stone, or block of wood. In a few days the ants would excavate a series of surface galleries and chambers, bringing up eggs, larvæ and pupæ, which were arranged in definite order and could be plainly seen through the transparent medium. It is better to use glass and cloth; but a great deal may be observed by using the stone or brick alone, only, in that case, the newly excavated chambers are generally disturbed.

Any one of the methods adopted has its contingent advantages; what answers, however, for one species, fails with another. The investigator will do well to avail himself of all the contrivances, using the one or the other according to circumstances. The way in which ants burrow in the earth may be admirably studied in a glass formicarium; but it must be remembered that ants so confined, find themselves constrained, and in some instances refuse altogether to commence making excavations.

QUERIES AND REPLIES.

QUERIES.

QUERY No. 18.—What is the best time to put on supers with section boxes, and will bees take to sections in which combs were partly built last season? GIPPSLANDER.

QUERY No. 19.—Will some of our readers, who use the extractor, state how many frames they can extract in a day with a *Novice* or other two-frame extractor? ED.

QUERY No. 20.—On examining my six hives, I find only one is moderately stocked with bees, two have barely enough to cover one frame, and the other three not much better. There is honey in all the combs, and I saw brood in three, but none in other three. What ought to be done with these stocks?

E. S., Mornington.

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NOTICE.

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THE

Australian Beekeepers' JOURNAL.

Vol. 1—No. 9.]

SEPTEMBER, 1886.

[PRICE 6d.]

EDITORIAL, NOTICES, &c.

BEE NEWS FROM ABROAD.

THE diseases of bees and their treatment is a stock subject for bee journals and magazines, and no wonder, for where apiculture is carried on as an industry and means of livelihood, it is a subject of the utmost importance. Of course, foul brood is the chief and most dreaded disease; still there are others which—a though perhaps not so contagious, are even more rapidly fatal to stocks if unchecked—claim attention, notably that disease which has been called a great many names, dysentery, vertigo, trembling disease, and, in its more advanced stages, shiny bee, or *Bacillus Gaytonii*.

For the treatment of foul brood one is at a loss what to try; the cures are legion, and now from our German brethren comes another, *bichloride of mercury*, or *corrosive sublimate of commerce*, a well-known poison. M. Naveau contributes a few lines on this subject on another page, translated from the illustrated German Bee Journal from Gravenhorst. Probably the bee farmer will find the shortest and cheapest way after all is the old one of taking the bees and queen from their infected hive and combs, and place them in a clean hive on full sheets of foundation, and feeding freely. Our experience so far is in favour of this plan.

The use of the vapour of crude carbolic acid, instead of smoke, to quiet bees, appears to be gaining ground in England, and all who have used it speak in the highest terms of its effectiveness and advantages. No matches, no fire going out at the wrong time, no bad words now, they say. We have tried it two or three times and it seems to do well; the fumigator is always ready, and requires to be

used very moderately only. This is the way it may be used. Get a little wire net cage that will go inside your smoker; into this cage put a small piece of sponge or some cotton wool; now get some of the ordinary carbolic acid used for disinfecting, and add to a tablespoonful of it half a teaspoonful of creosote and one tablespoonful of water. Shake it up well and keep in a well-corked bottle. If now about thirty drops of this is dropped on to the sponge or cotton wool in the wire net cage, and the cage inserted in the smoker, by working the bellows you blow out air impregnated with the vapour of carbolic acid and creosote. This vapour alarms the bees so much that they commence to gorge quicker than with smoke, and are, therefore, quieted sooner. In using this vapour, none should be blown into the entrance of the hive, but the cover is taken off, and the mat lifted at one corner, and the vapour blown gently under it among the frames; and as one gradually "peels" off the mat, the vapour is quietly diffused between the frames, quickly driving the bees to fill themselves with honey and thus becoming quiet. Great care must be taken that the sponge or cotton is not too wet with the fluid, or some may be blown into the hive, and cause the bees to leave.

In the apicultural exhibits of the Indian and Colonial Exhibition, some Victorian beekeeper exhibited a lot of nicely sealed 1lb. section boxes, and a writer in the *British Bee Journal* states "they are the best exhibit of the kind, and if the honey is only as good as it looks, should certainly have a high award."

The question of the best methods of introducing new queens to hives appears to be one that is not yet by any means settled, and like the cures for foul brood, every plan is good till

it fails. The fact is, the bees have their moods like other beings, and require humouring; the difficulty, however, is to know how best to do this. There are some simple, but rather inflexible rules, which, if adhered to, will make almost any reasonable method successful.

1. The hive to which a new queen is to be introduced must be queenless, and also without queen-cells.

2. It is best when the new queen is introduced directly (within a few hours at least,) after the removal of the old queen.

3. Neither the hive to be queened nor the queen should be disturbed so as to be excited beforehand, and except where a hive has been queenless for a long time or has fertile workers. If these conditions are adhered to, it does not appear to matter whether you cage the queen on a comb or in any of the numerous introducing cages, or adopt the Simmin's method of introducing the queen in a comb with brood and honey from another hive.

In the *Elsasse Bee Journal*, M. Vierling states in a late communication on his experience of foul brood, that phenol only cures when honey is coming in fast, and that the true cure is formic acid (bee sting poison,) which is produced abundantly during a liberal honey flow. He is of opinion that the bees cure it themselves when formic acid is secreted freely.

We have received samples of foundation from Messrs. Walters and Co., Carrington-street, Adelaide, both thick and thin, which is of excellent quality. The heavy, about $5\frac{1}{2}$ feet to the pound, is very fine, with sharp and full cell walls, and the wax is of first-rate quality. The thin foundation is also beautifully made of very pure wax. It seems superior to any imported foundation we have seen.—ED.

PROCEEDINGS OF BEEKEEPERS SOCIETIES, &c.

Victorian Beekeepers' Club.

AN ordinary meeting of the Club was held at the Public Service Association Rooms, the Melbourne Athenæum, on Monday, the 9th August, at 8 p.m.; twelve members present; Mr. Ellery in the chair.

After the formal business of the meeting was disposed of, a discussion took place on the best form of frames, spacing contrivances, modes of fixing foundation, and other practical points in connection with beekeeping. Some country members were present, and gave an account of last season's work, which, on the whole, was favourable, as the autumn harvest in most localities was very good, and in many

localities the Eucalypts blossomed all through the winter, which kept the bees working profitably whenever fine weather permitted.

It was decided to hold the next meeting about the middle of September, when it was expected there would be some interesting exhibits of bee appliances, including novelties from America. The meeting terminated at ten o'clock.

ORIGINAL CONTRIBUTIONS.

First Revision after Winter.

BY W. ABRAM, ITALIAN BEE FARM, PARRAMATTA, N.S.W.

DURING two or three months in the winter the bees do not work much, or rear young brood, but have rest when the weather is cool and rainy; while in August, as it gets warmer, they begin to fly out more on fine days for the benefit of their health, to relieve themselves after the long confinement. They then proceed to clean out the hive, and carry out all dirt, &c., that has gathered on the bottom of it. It is advisable now to give them some assistance, by opening each hive and sweeping out the bottom clean, with a strong feather or a small brush, by which a great deal of labour will be saved for the bees.

Strong hives will begin to breed about the end of July or early in August, while weaker ones will not begin for some weeks later, generally about the end of the latter month. At this time every hive should be examined carefully, to see that it has a queen and sufficient honey, as a great deal is required for the nourishment of young brood. Sometimes a queen dies during the winter, when there is no brood in the hive from which a new queen could be raised; and if the bees were successful in raising a new queen, she would most likely not get impregnated, as there are no drones about during the cold weather, and consequently she is of no use.

Again, some hives may have a good queen and not sufficient bees to warm and feed much brood. Such colonies, united with a queenless one, will make one good hive. If the queenless bees are much greater in number than those with the queen, then put the latter into the former hive, and cage up the queen for a day or two; if the reverse, put the queenless bees into the hive with the queen, between glass division and the door, and smoke them all. The most of the transferred bees will remain where they find a queen, and the few returning to the old stand, when they find it empty, will beg themselves into a neighbouring hive.

After the first revision is finished, and the queenless hives united to the weak ones, some hives may be found strong and with plenty of honey, while others may have little brood and not sufficient honey. When this is the case, a frame of honey from the well-stocked hive can be taken and put into the one that is short. The same can be done with a brood comb; but this must be placed right in the middle of the brood nest, while the honey may be placed next to the glass. In either case all the bees must be brushed off the combs before putting into another hive. If, in a fortnight's time, some hives are still weak, another brood comb without bees may be given, and an empty worker comb should be placed into the hive from which the brood comb has been taken, which the bees will soon clean, and the queen will commence to deposit her eggs. Should the bees be short of honey, and no comb honey is to be had, and none to be gathered, then they can be fed on thin honey mixed with water, or with the best sugar, boiled with at least one-third of water, and well skimmed. As long as the bees have a flight nearly every day, thin honey or good sugar will do no harm, but will stimulate their breeding. To put lumps of dry sugar into a hive shows ignorance of the nature of the bees.

The number of bees, though small at the end of the winter, soon increase after young bees commence hatching, and, in a very short space of time, if the weather be warm and honey be gathered, the bees will cover every comb, and the queen will deposit eggs in all clean and empty cells. Then the desire for building comb arises, and, if the hive is not full, the bees commence building new comb, and in time the queen prefers to lay her eggs. Should the brood room not have all frames full of comb, now is the time to make the bees supply the deficiency, and, as the comb near the glass is seldom used for brood, this is taken out, and the second and if there is no brood in it, then put in one or two empty frames with gummy comb, and replace the comb you took out.

In a short time the bees will fill the empty frames with comb, and it is only necessary to examine them occasionally to see that they are building them straight. When these are built down nearly to the bottom, one or two more may be put in, and so on till the brood room is full. As the Italian bees do not produce so many drones as the black bees, there is no necessity to keep the drone comb down; the more Italian drones there are, the better is the chance to have the young queens purely impregnated; but black bees must be examined every week and the drone comb cut down, as they always rear by far too many

drones, and if the rearing of Italian queens is carried on, no black drones should be hatched by those who keep Italian bees.

SWARMING.

If a hive is full of brood, and densely crowded with bees, they make up their minds to swarm, and thus form a new colony. They begin to build queen cells on the sides or under the ends of the combs, in which the queen deposits fertile eggs. In two days the egg hatches into a larva, and some of these are fed by the bees on prepared food; and the seventh or eighth day, when the cell is nearly filled with food, it is capped over. Then the queen in the hive will begin to feel uneasy, and almost cease laying: she knows the time is near for her to leave her home with a swarm. The bees themselves exhibit the same feeling, and many of the honey-gatherers remain at home to be ready to join the swarm. On a nice, warm day (not too hot,) some of the bees commence running about excitedly inside, and around the entrance, increasing rapidly in number; and in a few minutes all the bees intending to join the swarm, having first filled themselves with honey, rush out into the air, and cruising in a zig-zag near the stand, slowly approach a tree, shrub, or other suitable object, which they all settle on in one mass. This they do, partly to see if the queen is with them, and partly to prepare to continue their flight to a new home. Sometimes the queen does not leave the hive with the swarm. Either she likes her old home too well, or, not being accustomed to fly out, a sudden fear overtakes her at the last moment. In that case the bees return and swarm again the next fine day. In many instances the queen may not be able to fly far, being wing lame, &c., and may fall to the ground unnoticed by the bees, who will return, as soon as they perceive their loss, to the old hive, and wait for the hatching of young queens to swarm again. The foregoing remarks apply to a first swarm, but a strong hive, in favorable weather, will give off one or more after swarms, a sign of which is the peculiar cry of the young queens in the hive, as well as the one hatched out already, the day before swarming.

As soon as a swarm has settled on a branch of a tree or bush, it should at once be caught in a box or in a hive, and put on its new stand in a shaded place; for if it is left for any length of time, it will probably start, especially if the day be warm, for a more suitable home, and thus be lost. Before a first swarm leaves the old hive, it sometimes sends out spies to find a new home, and these spies lead the swarm to the place they have found; but even if this has been done, they will first

settle near the place they have left, and if caught without delay in a suitable hive, they will not leave it.

Bees, when swarming, do not attempt to sting, and the sooner they are caught there is the less danger of being stung; but if they have been out for some time, sprinkle a little cold water over them, and treat them gently. Place the hive, or box, right under the swarm, and give the branch they are on a good shake, when they will nearly all fall in; cover the opening quickly, and put the hive upright, opening the entrance after a few minutes. If the queen is in the hive, all the flying bees will soon follow, and when only a few are left flying about, take the hive very gently and carry it to the new stand.

Through my experience in taking thousands of swarms, I have ascertained that the size of hive should be in proportion to the size of the swarm. A small swarm, if put into a large hive, dislikes it; the bees seem to feel that it is too large to keep clean, and they cannot defend themselves as well, or keep warm in cool weather, while, on the other hand, a strong swarm, in a small hive, has not room enough to work, and the heat inside is too great. All these matters are taken into consideration in the construction of my hives, and although all are the same size, the glass division serving the purpose, closing up the hive with three, four, or more frames, as required, according to the strength of the swarm.

Notwithstanding the remarks I have made, I have further found, by long experience, that it is often very troublesome to catch swarms, for they will sometimes fly to a very high tree where it is very difficult to get at them, or they may perhaps fly some distance and settle in a neighbour's garden, and frequently in windy weather the queen gets lost, and half the value of the swarm is lost thereby, or several swarms come out at the same time and get mixed in their flight and settle all in one mass, which they generally do, soon killing some, or perhaps all, the queens of the different swarms. To prevent all this trouble and loss I use a swarming bag; by the use of this I catch all the swarms separately, and without difficulty. The open end of the bag is fastened before the entrance of the hive at the very moment the swarm commence rushing out, the other end is tied up and hung on a stick at a little higher elevation. As soon as the bees are all out and in the higher end of the bag, the end to the entrance is unfastened and tied up; the swarm can then be hung in a well shaded spot, and sprinkled sometimes with water till there is leisure to put it in a hive. I have caught ten swarms in these bags in as many minutes.

What could I have done without the swarm catcher? Of course, this method requires practice, but all experienced beekeepers know, or ought to know, by the manner of the bees outside a hive, five minutes before the swarm issues.

A great deal more could be said about swarming; but to describe everything in detail would require the space of a book, so the kind reader must excuse me if I mention briefly the principal points only, and I shall now proceed to describe artificial swarming.

ARTIFICIAL SWARMS.

As the black bees, in the old gin cases, &c., generally in use, as a rule, swarm often enough, I need not mention how to make artificial swarms from such hives, so my remarks will be for those who keep frame hives, more particularly for those who have the Italian bees, as they do not naturally incline to swarm as often as the black bees. Although there are various methods, I shall recommend the one following I have proved to be the best:—

An artificial swarm can be made when a hive is full of bees and brood, by dividing it in the following manner:—Take seven or eight frames out and put them into the frame-holder, then select from them four or five frames with the most capped brood—one with honey, then put them, with all the bees on them, except the queen, into a new hive, and brush some more young bees from the other frames as well, the remainder of the frames are returned to the old hive, with the queen, and empty frames or some with worker comb in them are added to replace those that have been taken away, so that the loss of brood, &c., is soon repaired. An impregnated queen should be kept in readiness to introduce to the new swarm. This should be caged for a day or two till the bees know her and become friendly to her. We always keep a number of pure fertile queens, and introduce one under a cage at the same time the new swarm is made, and fewer of the bees will leave for their old home. If no queen can be introduced, the bees in the new hive ought to be shut up for a day in a cool dark place, with the ventilation board open, or else too many bees would return, and after two days a nearly ripe queen cell should be introduced, or otherwise the bees have to make their own queen cells, and are kept without a queen for a much longer time, and consequently are all the time getting weaker. Should the young queen get lost on her marriage flight, which sometimes happens, some very young brood-eggs and two days' old larvæ must be given to the queenless bees to enable them to raise another

queen; but as all this time the bees are getting fewer, it is better to purchase a pure impregnated queen.

The parent stock hive, in which the old queen remained, will soon be as strong again, and in about six weeks another swarm can be made, if it is not too late in the season; or if you desire to obtain more honey, let them fill the honey-chamber with comb and beautiful honey, which will be a real delicacy on your table, and your friends would not be angry if you make them a present with a comb of sweet nectar bottled by your industrious little bees.

11th September, 1886.

Beekeeping for Beginners.

[NOTICE.—In our last number, No. 8, August, the article "Beekeeping" was divided in error, and the portion relating to swarming appears on page 93, instead of at the end of the article "Beekeeping for Beginners" on page 87.]

HIVES.

It has been assumed that our beginner has had his bees in a box-hive, that is, a packing case, a gin-case, a candle box, or something of the kind, therefore he can know very little of the internal condition of the hive, except what he can gather from the behaviour of the bees outside, or from the very imperfect inspection afforded by looking under the box and up among the combs. Now, to obtain success and the best returns, it is absolutely necessary to keep bees in frame-hives. These are the chief reasons: You can manage and control the bees better; you can always ascertain their condition, and help them in disease or trouble, and feed them easily when short of stores; you can divide stocks, swarm them artificially, strengthen weak ones, remove and exchange queens, rear queens, take honey without killing a bee, extract honey from the combs, and return the comb uninjured to the hive, and so on; many of which operations are next to impossible, and the others, to say the least, very difficult with boxes. Our advice is, then, get frame-hives as soon as possible; transfer your bees and combs from the boxes to the frames, and discard box-hives altogether.

Frame-hives are made of many forms and dimensions. English beekeepers have several patterns, but widely agree all to have the simplified frame, which is called the *British standard frame*; its dimensions are 14½ inches x 8 inches. American beekeepers have many hives and many sized frames, and so with German, French, Italian, and Swiss beekeepers, a general want of uniformity exists. In Australia, however, a very nearly unanimous opinion has

been expressed in favour of adopting, as the standard frame, the one known as the *simplicity Langstroth*, whose dimensions are 17½ inches wide, by 9½ inches deep, and this may be now regarded as the Australian standard. So many advantages may be derived from using exactly the same sized frames as other beekeepers, that we advise our beginner not to be beguiled into purchasing any hive except it is made for and contains the true-sized frame.

We do not mean to say that bees have a preference for one sized frame or one kind of hive over another; but there is this to be said, that among English and American beekeepers the tendency is to finally adopt frames that are somewhat wider than deep, and it is almost universally agreed among them that a hive opening at the top and out of which the frames can be lifted is the best for numerous reasons. Under these circumstances, and bearing in mind the fact that where frame hives are adopted, the Langstroth is used by most beekeepers in Australia and New Zealand, we recommend the Langstroth frame and hive.

The dimensions of the simplicity Langstroth hive are as follow:—Main hive or brood box, inside measure, 17½ inches from front to back, 14½ inches from side to side, and 10 inches high; this being made of boards ½ of an inch thick, will measure outside 18 inches from side to side, and 20½ inches from front to back. Now the frames will fit into these and hang on the front and back so as to hang parallel with the sides and will leave "bee space," that is, about ⅛ of an inch between the ends of the frames and the inside of the box, and between the bottom of the frame and the bottom board when the frames are let down to a shoulder which is made inside the back and front boards for their reception. It is not an easy matter to give a description of how to construct these hives without diagrams which shall be intelligible to those who have only a slight knowledge of carpentry; but nevertheless we intend giving such a description further on.

The main hive or brood-box, as we will call it, will hold ten frames at their proper distance apart, viz., 1½ inches from centre to centre, this being found the best distance to allow of the bees building their combs of the thickness required for brood rearing, at the same time leaving sufficient room for the bees to move about and cluster between the combs. As this portion of the hive is generally given up to brood, and hence is called the brood-box or cluster, arrangements are made by which another box, which may be exactly the same as the brood-box, can be placed above it, when it is called a *super*; in this the bees will store their honey so soon as the lower box is full of bees, brood and honey, and such honey is

called "surplus" honey. It is usually the purest honey, and often quite free from any brood or bee bread, in fact, virgin honeycomb. If the super is the same size as the brood chamber, the same frames may be used as below for the bees to build their combs in, or if it be a half-storey, that is, a box of the same size, but only five 5 inches deep instead of 10 inches, shallower frames may be used; but it is more usual to use what are called *section boxes* for the half-storey and often for the full storey super as well, instead of frames, unless the beekeeper works for extracted honey, as will be explained further on.

If, therefore, we take a box of the dimensions named (but without bottom or top,) and place it on a bottom board with an entrance provided, and place above a roof or cover to keep out the rain and weather, we have a one-storey hive; by lifting off the roof or cover and putting on a shallow box 5 inches deep, and placing the cover on this, we have a "storey and a-half" hive; but by using a box the same depth as the brood-box, and putting the cover on this, we have a *two-storeyed* hive. In very strong colonies we can sometimes add a third, fourth, and even fifth full storey, the hive is then said to be "tiered up" two, three, four, or five storeys, as the case may be.

The section boxes referred to, are little square frames, made of very thin strips of wood of a size that when filled with comb and honey weigh just about 1lb. They are called 1lb. sections, and a half-storey will hold twenty-eight, or a full storey fifty-six of such boxes. An important point in the construction of such hives is, they should be all of exactly the same dimensions, and so made that one will fit on the top of another exactly; and in order that it may be weather-tight at the junction, the boxes are rabbeted outside all round, then top edges and inside all round the bottom edges.

CORRESPONDENCE.

THE LANGSTROTH AND BERLEPSCH HIVES COMPARED.

(To the Editors of the *Australian Beekeepers' Journal*.)

GENTLEMEN,—Having replied to the first letter of "Apis'" criticism of "The Langstroth and the Berlepsch Hives Compared," it is now my wish to say a few words in reply to his second letter, in which he tried to show that the Langstroth hive is the easiest to manipulate, and adds—"How is it with the Berlepsch hive?" Well, that the Berlepsch is easy manipulated is proved by the fact that I worked 250 hives last season; and while "Apis" is moving the frames laterally a little

in order to be able to take one out of the hive so as to get room to move and examine the others, I can do the examination as quickly as he, by taking the frames out and placing them on the frame-holder; it matters little, if the frames must be moved, whether they are moved a little or taken out altogether, and in order to get at the frames in the brood-room, I have nothing to do nor to remove any of the supers, so that actually the Berlepsch hive has the facility which "Apis" thinks by far the most valuable. As to propolis, "Apis" himself admits that the bees propolise the ends of the frames and "bridge" the combs even in the Langstroth hive, and he asks: "How can the propolis be removed and the frames loosened in a Berlepsch hive?" He knows how to do it in the Langstroth, but as the Berlepsch hive is new to him, he thinks that that which he cannot understand no one else can, and that ought to settle the matter. The grooves of each hive are cleaned once or twice a year, with a tool made for that purpose, and the frames are taken out with another special tool, and there is no jarring and no comb breaking at all. No queens and no bees are lost by getting the bees off the comb: first, the queen is not on a comb full of honey, and second, there are no young bees either—queens and young bees are on brood-combs. "Apis" should know that. Moreover, what is a problem to him, is not so to everyone.

In the Berlepsch hive, the outside of the frame facing the operator intercepts all the light, and if the queen is on this side, it is taken out before she has time to run away; and if she is farther inside, she will not be disturbed at all until the other frames are taken out to the one she is on; while, in the Langstroth hive, if one of the middle frames is removed, there are two sides exposed to the light, and if the queen is on either of the two sides, she cannot be seen, and has ample time to run inward.

What "Apis" says about the bee-shed, and so forth, is sufficient in itself to prove that his knowledge thereof is limited, and he is jumping from one extravagance to another, that it would be useless to say more about it, and I give him to understand that I esteem it an honour to be allowed to argue in this journal on any point concerning beekeeping, but I do not feel called upon to fight with everyone who propounds such nonsense as "Apis" does.

In this long argument with "Apis," I have felt at a disadvantage, because I am not a master of the English language, and because my antagonist hides himself and his nonsense behind a *nom de plume*. I shall in future decline entering into a controversy with any correspondent who is afraid to let his name be

known. It is only fair that the readers should know the qualification of any person who professes to teach them beekeeping.

Lately the reversible frames are said to be the means of making the Langstroth hive complete. It looks well on paper, and as a matter of course many a bee-man is sorry to find the sections empty or only half filled when the brood frames are stocked with honey; but will reversing the frames induce the bees to carry the honey far up into the sections, perhaps several stories high? In consequence of the natural instinct, the bees spread their brood to a certain extent, and immediately above and around it place their honey store. Of what use would it be, for instance, to extract all the honey from the brood frames, and then feed it again. Will the bees carry it up into the sections? No. But it is easy enough tried, and the result will be about the same as with the reversible frame. What if, in the time the bees are forced to carry their sealed-up stores from one place to another, plenty of honey could be gathered outside? And what about the trouble the bees have to reform the cells into their natural shape again?

Mr Naveau discovered, during his very short trial of one Berlepsch hive, that in regard of wintering it cannot be surpassed; and he would have discovered other advantages had he longer experience. That in his extractor these frames do not fit for extracting is not a fault of the hive or frames, but of the extractor. If the propolis be removed before the cold weather sets in, and as we should not disturb our bees in cold weather, there is another complaint removed; and it is the bee-man's duty to see that every new comb be built straight in the frame, and then they will not be fixed together, and everything goes smooth.

W. ABRAHAM.

Manager Italian Bee Company, Parramatta,
N.S.W.,

11th September, 1886.

(To the Editors of the *Australian Beekeepers' Journal*)

GENTLEMEN,—In the illustrated German Bee Journal, from Gravenhorst, I read an article on the cure of foul brood, and it is stated there, that even by the use of phenol the disease sometimes breaks out again. Dr. Paul Jauch recommended chloride of mercury. This remedy was tried by several members of the Association, and the cure was so complete, and the disease was so entirely eradicated, that it never broke out again. The way how it is used is as follows:—All

the frames are lifted out of the hive into the comb-holder, and then the inside of the hive gets thoroughly sprinkled with the chloride—a solution of one part in 20,000 distilled water, or 1 in 18,000—with a spray or an atomizer. Then you take the frames, and those cells which have foul brood in, have to be opened with a pin or penknife, so that by sprinkling the chloride gets into those cells, and after this operation the combs may be returned to the hive, and the work is done. By the use of the chloride of mercury, the slimy, foul, broody matter in the cells dries up completely that the cells become easy for the workers to clean. After three weeks, inspect the hive again and give them another sprinkling; but should some combs be too badly affected with the disease, it is better to destroy such combs, for the bees are capable to building new combs quicker than cleaning the old ones, particularly if foundation is given them.

Formula for the solution of chloride of mercury (corrosive sublimate:—)

	Part.	Distilled Water
Corrosive sublimate	1 by weight to	20,000
or	1 do.	18,000
in very bad cases	1 do.	15,000

The article referred to is in German, and which I have translated and given the substance in the above.—Yours, &c.

H. NAVEAU.

Hamilton, Victoria,

10th September, 1886.

[The above method of treating foul brood is by no means troublesome, and it appears quite rational, as the chloride of mercury is a powerful germicide. The dose is almost homœopathic, still it is a very powerful drug and has to be used with caution. If we are unfortunate enough to get foul brood among our stocks we will certainly try it.—Ed.]

(To the Editors of the *Australian Beekeepers' Journal*.)

GENTLEMEN,—With great pleasure I hailed the arrival of another number of our *Colonial Bee Journal*, and I find that it is not only becoming more interesting, but contains matter of vast importance to those who will avail themselves of it. But I am very sorry for the antagonistic spirit shown by some of the correspondents. I think they should all endeavour to advance our interests in a more friendly spirit. For instance, the comparison made by "Apis" to a kitchen window in a large house with the glass back in the Berlepsch hive is not at all appropriate. True it is, of course, that from a kitchen window all the contents in the house cannot be observed; but this cannot be said of a beehive, where the

brood chamber only contains one compartment, and although all the interior of the hive cannot be observed, yet I know, from my own practical experience of more than twenty-five years with hives with a pane of glass in the back, that from a glance I could tell the condition of the hive. If "Apis" has not got this experience yet, it is not the fault of Mr. Abram. Whenever I went to one of my hives during the winter months, and withdrew the slide covering the glass, I could at once tell whether there was food in the hive or not, or when I could not observe some of the inmates a slight tap with my fingers would soon convince me whether the bees were lively or dormant. I need not go further on with this subject, or I could very soon convince the reader that a glass window in a hive is a matter of vast importance to one who keeps bees, not only for profit, but for pleasure also. There is yet another article I should like to say a little about, and that is the one so ably written by our friend Coleman, across the border. I could not improve on it; still I would give this good friend, and not only him, but all those who manufacture foundation, this one advice, that is, do as I do, and instead of using such disagreeable stuff as soapsuds as a lubricator, use syrup made from extracted honey and warm water. Gentlemen readers, this is perfection; once try it, and you will never regret it. It gives the foundation a beautiful glossy appearance, it makes it more pliable, and it never gets, even if kept on hand from one season to another, so brittle as that on which starch has been used as a lubricator; and the best of all is, the bees accept it far more readily than any I have ever used before.

H. NAVEAU.

Hamilton, Victoria,
16th September, 1886.

(To the Editor of the *Beekeepers' Journal*.)

SIR,—We have established a Beekeepers' Association with very good prospects. The attendance at the first and subsequent meetings showed the interest our beemen are taking in the matter, and from all parts of the Colony, beekeepers are sending in their names and subscriptions.

The first monthly meeting was an interesting one, free conversation on a variety of bee topics being indulged in.

The adulteration of honey by some dealers and exporters was freely canvassed, and it was decided to have samples produced whenever adulteration is discovered—exposure to follow.

The necessity for more correct information on the bee flora (native) was acknowledged,

and efforts will be made to have a list compiled, giving as full information thereon as possible.

The prospects of the coming season were discussed, and the general opinion was expressed that a good ingathering, with large increase of stocks, may be fully expected and prepared for.

We have had a remarkably mild and moist winter, and the spring is unusually favourable, scarcely a week without some rain. Vegetation is luxuriant, flowers plentiful—the native bush promises to be a mass of blossom in a very short time. This, together with the fact that the boxes are full of bees and the combs more completely filled with brood than is sometimes the case at this particular time of year—plenty of the stocks with light frames (Langstroth) as nearly full of brood as may be just a fringe of honey, betokens an immense yield if the stocks are properly managed.

I heard of some swarms in August, but nights came in chilly again and checked it. There will be fun in the bee yards in a few days hence, when the atmosphere warms up a bit. I have been working a solar wax extractor with considerable success, and predict this will become universal, cheap, clean, effective, and no trouble.

My friend, Mr. Naveau, has tried to smooth matters between Mr. Abram and myself, anent the German hive. I am quite aware of the distinction set up for the Berlepsch hive, Dr. Dzierzon uses two kinds, and is particularly partial to one with a top bar only.

I have worked this plan; it is no good for the extractor. Dzierzon's hanging frame, two storeys to each hive, that is, a stock and super is so much like the Berlepsch, that the principle is the same in both, and it is the principle, not the details, that I object to, for the reasons so fully set forth by "Apis" and supported by Mr. Naveau. Root's chaff hive, two storeys, will give Mr. Naveau the hive *par excellence* for out door wintering in Victoria, and for protection against sudden changes, or *hot wind* days too.—Yours,

(HAS. FULLWOOD.

Brisbane, 16th Sept., 1886.

NEW BOOKS, REVIEWS AND EXTRACTS FROM FOREIGN JOURNALS.

STRENGTHENING WEAK COLONIES.

Doolittle's Plan of Doing it.

WHEN spring arrives, most beekeepers find that they have more or less weak colonies, even when their bees as a rule winter well; while now and then a spring finds some of us

with a loss of nearly the whole apiary, and the few colonies remaining are mostly weak, or perhaps we have a pair of the few weak, and a part strong. If many weak colonies are on our hands, and we are not anxious to augment our numbers, probably the best way would be to unite them till all are in comparatively good condition. But it more often happens that, when we have many weak colonies, we are the most anxious to save them all, if possible, for we get many weak colonies only after a heavy loss during winter, in which case we are desirous to increase all we can, so as to utilise our empty combs before the moths destroy them.

Many ways have been devised to give strength to these weak colonies, so as to keep them along till settled warm weather comes, so that they could build up; but most of them have proven failures when put in practice. The most general plan is that of giving hatching brood from the strong colonies to them; but, as a rule, this results in a loss of a part, if not all, of the brood; for the amount given must generally of necessity be more than the weak colony can cover and keep warm, while the young bees so hatched seem to lack the necessary vitality among so few old ones to keep the warmth up during cold nights; hence it often happens that all perish together. If brood is given, it is better to adopt the plan the Editor did several years ago, which was, to take a cake or biscuit cutter, and cut out a small portion of a frame of brood, and all of that just gnawing through the cells, and insert this in the weak hive in the comb, which the few bees cover. However, this does not always work, as the Editor well knows; besides, it mutilates the combs so as to spoil their beauty, and when wired frames are used, it is out of the question altogether.

Well, after all my trials, I have at last struck on a plan which has so far worked to perfection, and by it I am able to put a weak colony right "on its feet" without materially injuring the strong ones. The plan is this:—Take the wire-mesh box I have before described in *Gleanings*. Perhaps I had better describe it again here, so that the new subscribers can make one. Make a box of any size to suit you (I use one holding about six quarts,) and cover the two sides with wire cloth. Through the top bore a hole to admit the small end of a large funnel, such as is used by those who sell bees by the pound, and make a slide to cover this hole after the funnel is removed. Now proceed to your strongest colony if you have no such one should be bought, if possible, as it will pay largely on the investment,) and look it over till you find the queen. Put the frame she is on aside from the others, so as to make

it impossible to get her in your box, when you will select a frame well covered with bees (or two partly covered.) Now drum lightly on this frame so as to cause the bees to fill themselves with honey, and set it down by the hive. While the bees are filling themselves, put back the frame having the queen on, and adjust the hive, except leaving a space for the frame which the bees are on. As soon as they are well filled, adjust the funnel in the box, when they are to be shaken down through the funnel, and the box closed with the slide. After putting the frame back in the hive, and closing it, the box of bees is to be carried to a warm room and a blanket thrown over the box to keep it dark, when it is to stand three or four hours. During this time the bees will realise their queenless condition, and set up a great huzzing, telling plainly of their loss. Now go to the weak colony you wish to strengthen, and get their queen, which is to be put in with the bees in the box. To do this, set the box down suddenly, so that all the bees will go to the bottom; then quickly draw the slide and drop in the queen, closing it again. Cover up again and leave until about sunset, or three or four hours more, when the bees will be found clustered compactly like a swarm. Now go to the colony from which you got the bees, and get a frame of hatching brood, without bees, and put it in the hive containing the weak colony, when you will at once have the bees from the box on it. If the evening is at all cool, I shake the bees from the box right on top of the frames so that none shall get chilled. I think all will see the "why" of the plan, without my explaining further.

G. M. DOOLITTLE.

Borodino, N.Y., April, 1886.

Friend D., your plan will work all right, without any question; but you will excuse me for suggesting that there is too much machinery about it to suit our work. If I wanted to strengthen a colony during apple-bloom, or at any time when the bees are working fairly, I would just lift the frame-brood, bees, and all, out of any hive that could spare it, during the middle of the day, when most of the bees are in the fields, and set it in the hive that needs strengthening. I would be careful that the frame did not contain very much unsealed brood, however. As most of the flying bees are in the fields, the bees covering the combs in the middle of the day will be, as a rule, young ones; and with us, such a frame of bees will not quarrel, nor be quarrelled with, one time in ten. Just set them quietly between the combs of the weak hive, and let them get acquainted at their leisure. If they

do quarrel, a brisk at smoking will generally make them peaceable with each other.—*Gleanings in Bee Culture*, May, 1886.

NECTAR.

THE nectar of *Protea mellifera* evaporated to a syrup, and thus obtained in large quantities from abroad, contains no nitrogenous matter: 73·17 per cent. of solids, of which 70·08 is grape-sugar, and 1·31 cane-sugar. Grape-sugar was obtained from the syrup in a crystalline form. Besides the sugar, a small amount of formic acid (apparently brought by the bees) and ash was present. The following table gives the percentage of sugar in the fresh nectar of three plants examined:—

Nectar from—	Total Solids.	Total Sugar.	Cane-sugar.	Grape-sugar.
<i>Bigonia radicans</i>	15·30	15·27	0·43	14·84
<i>Protea mellifera</i>	17·66	17·06	0·00	17·06
<i>Hoya carnosa</i>	40·77	40·61	35·65	4·99

Watery extracts of various flowers were also analysed; the small quantity of sugar present in them may be seen from the author's calculation, that in order to obtain 1 gram of sugar (corresponding with 1·3 gram of honey,) the bees must suck 2129 flowers of the alpen rose; 2000 of the acacia, *Robina viscosa*; and 5000 of the *Onobrychis sativa*.

[Translated from an article by A. V. Planta in the Zeit: Physiol: Chem: B. 10 seit, 247, 247.] W. D. H.

COMB AND FOUNDATION ALTERNATELY.

SUCH is constantly recommended upon which to place swarms. We doubt, however, its advisability, for this reason: When a frame of foundation is placed between two fully worked out frames of comb, if honey is coming in fast, the combs will be filled, and their cells lengthened before the foundation is drawn out; consequently, the new combs will be narrowed for want of room. Experience has proved to us that this is almost invariably the case, and we can show hives now, of two years' standing, where the alternate combs are twice the thickness of the adjoining ones, an unevenness which has arisen entirely from following this plan. It is best, therefore, to confine the swarm to six or eight frames of foundation, according to its size, in the centre of the hive, by division boards, for the first three or four days, and then to place frames of comb with worker cells on the outsides of the newly drawn out and brooded combs, at the same time giving a super as well. This may be safely done if the swarm occupies the stand of the colony from which it came, and the weather is at all propitious.—*British Bee Journal*.

CARNIOLANS.

I FIND the Carniolans, when strictly pure, to all have that steel-blue colour that has been spoken of, and that they resemble the blacks but very little more than the Italians do. The white-grey rings Ernest speaks of are very prominent, and will show themselves at once when crossed with other races. In form, it is true, they resemble the Italians; but I feel sure that Ernest will change his mind in regard to their disposition when he handles them more; for I find no need of smoke at all in handling them. They remain on the combs quiet although they can be shaken off as easily as any other race of bees I have ever seen, and, as has been said, at once cut for the hive, instead of taking wing. It is true, that when you are handling them they seem to take no notice of even robbers that may be flying round the comb; but let a robber attempt to alight at the entrance, and he is handled as roughly as well could be. I find the Carniolans to be equal to the Cyprians for protecting their hives, and as good workers as I have ever seen, as far as I have tested them.

One other peculiar point is to be credited to the Carniolans, which is, they gather no propolis at all. All cracks are filled with wax instead of propolis; consequently the frames are free from that sticky substance gathered so largely by other bees; and then the sections are so much nicer to handle. Besides, their combs are as white as the driven snow. As far as beauty is concerned, that depends altogether on different people's notions of colour. What suits me best is, the bees that will give me the largest amount of nicest-looking comb-honey with the fewest stings.

Now, I have not fully tested the honey matter to my entire satisfaction, but I have the matter of stings, and am fully satisfied that they are less inclined to sting than any other race of bees I have ever seen. When I have had another season's experience with them I will report further. I hope others will give their experience with these bees—*American Bee Journal*.

FINISHING SECTIONS.

WHEN the honey-flow begins to fall off, it is important to get unfinished sections completed as soon as possible. Do not, therefore, place cases of sections beneath those which are partly filled; but if crowded with bees, still showing want of room, a case of sections may be given above the partially filled case. The bees, entering the upper sections, will draw out foundation, which may be stored and used another season, and will seal over more quickly the lower

ones. Another plan is to remove the unfinished case entire, to store the sealed sections, and having placed the unfinished ones in the boxes of the "Raynor divisional rack," each of which holds seven, to return them to the centre of the hive, covering the exposed outside frames with strips of board, carpet, or felt. Sections completed should be stored in a dry and rather dark room, and covered with canvas, net, or muslin, to keep them free from dust and flies, and to allow the air to circulate freely around them; by such means granulation may to a great extent be prevented. The temperature of such a room should not be allowed to fall below 60 Fahr.

Removing Section-cases.—1. Some appear to experience a difficulty in removing cases entire; and 2. one correspondent complains bitterly of burning his fingers while endeavouring to carry out our suggestion of steeping a cloth in carbolic solution and spreading it over the super. To the former we reply that when the operation is performed according to our directions, in no single case have we met with the slightest difficulty, or suffered from a single sting.

Not to recapitulate, let reference be made to our last hints, 5th July, p. 303. But if smoke be preferred to carbolic solution, let the bees at home be driven downwards from the sections, and the whole case be removed while gently raising it by leverage during the smoking, and carrying it indoors as directed. Never smoke at a distance, or the bees will be driven into the sections; act quietly, and let there be no jarring, no hurry. Following these directions, we rarely either get a sting or irritate the bees.

Where several cases are "tiered up," one above the other, the uppermost case must be first removed, then the next in order in like manner; plenty of smoke being used, and the help of an assistant. The use of a veil gives confidence, but keep the hands uncovered, and, if afraid of stings, spray them with a very weak solution of carbolic acid. Working in all weathers with uncovered hands, and using the above-named solution, the skin becomes tough and hard but very brown—O ye nymphs and stings, if impanted—which they very rarely are—give us neither concern nor inconvenience. Being case-hardened, moreover, we can wring out a cloth, when steeped in the prescribed solution, without blistering our hands—in fact, with perfect impunity. We have frequently warned our readers of the dangerous nature of carbolic acid—and we cannot always be repeating warnings; when, therefore, complaint is made of blistering hands and skin, we can only suggest that more care should be used. Surely it is possible to find some means

of squeezing dry a cloth without plunging the hands into the solution. In case of accident, a little oil rubbed on the spot immediately will prevent ill effects. Two ounces of carbolic acid, the same quantity of glycerine, and a quart of hot water, will mix well, and is the safest solution for general purposes; but it will blister the skin. In removing sections, we much prefer it to smoke, and it is more effective. A long and strong goose-quill soaked in the above, wiped dry and passed between the sections, will quickly dislodge every bee, and will leave neither scent, flavour, nor any other ill effects behind. When the section-cases are removed, a few passes of the feather over the tops of the frames, no matter how crowded they may be with bees, will cause every bee to disappear at once, and, what is more, will take all the sting out of them.—*British Bee Journal*, 22nd July, 1886.

NOTES AND NEWS.

Observation of Flowers visited by Bees.—September—Wallflowers (moderately;) beans, white mustard (largely;) small pink *Mesembryanthemum* (largely;) *Pittosporum* (very few;) wattles (freely;) Cape Broom (freely;) single camellias (very largely.)

THE HONEY BEE.

THE bee is one of the most wonderful insects in all creation. A whole lifetime can be spent in studying its habits and still all will not be known. We will cite one or two instances in which Prof. McLain's labours are liable to prove a great value. It is known that the tongue of the honey bee is not sufficiently long to reach and gather the sweets of red clover. That plant is only fertilised imperfectly through the workings of the bumble bee. The sweets of the red clover are pure and of fine flavour, and would greatly aid to quantity and quality of honey, if it could only be gotten at by the honey bee. The question was—how to go to work to accomplish this end. The red clover blossoms could not be induced to change their form for the benefit of the bee, and so it became evident that the bee must undergo a change. Its tongue must be lengthened. It would be impossible, and owing to the extreme warmth of the insect's latter end, dangerous to catch each individual bee and try to stretch its tongue.

He professor thought long over the matter, and arrived at a much better plan than this. He arranged a fine wire screen, and on a smooth surface beneath this he spreads a thin

coating of sugar. And here the bees on which he is operating are compelled to feed. He places the sweets out of reach of their tongues through the screen. As they get hungry, and still more hungry, they strain their tongues and run them out just a l-i-t-t-l-e further till they reach the sugar. When they get so they can feed upon the sugar easily at this depth, the plate containing the sweet is dropped a trifle lower—perhaps the thickness of a sheet of tissue paper. In this way the professor will lengthen their tongues, and he will continue to breed these bees and stretch the tongues of each generation until a variety of bees will exist with abnormally long tongues adapted to the red clover blossoms.

Among the many more ingenious things Prof. McLain is now experimenting on is the production of larger bees. He is arranging for this result by artificially enlarging the cell in which the queen bee is formed. He thinks he can continue this for a few generations, until we have bees as large as June bugs, if not rivaling in size the humming bird. If the professor is fully bent on doing this, we are going to see him about leaving out the stingers, for if one of his old sockdoilgers should hit a fellow behind the ear he would think he was struck with a red-hot cannon ball.—*Aurora Blade*.

QUERIES AND REPLIES.

REPLIES TO QUERIES.

No 18.—The best time to put on supers is when the brood chamber is pretty full of bees, but not earlier. If, when the hive cover is lifted, the bees well up over every frame, then they should be put on without further delay unless you wish to encourage swarming, in which case they should not be put on at all. Giving extra room, by supering, often prevents swarming.

Bees readily take to the last season's sections if they are clean and free from moth or other invaders.

No. 20.—The stocks E.S. refers to are in a bad way. Either the stocks which have no eggs or brood must be queenless, or the queens are old and exhausted or diseased. In any case the following is the best course to pursue:—See which stock has the most prolific queen, which can be seen now by the amount of brood present. Select this stock as your "mainstay," and unite all the others whose bees do not cover two frames at least to this one, observing the ordinary rules for uniting, that is, gradually approaching all the hives one to another, till they are close

together, and then searching for the queen (if there is any) in each of the weak hives, and remove them. Now open out the frames of the hive which has been selected as the best, and insert the frames from the weak hives alternately with them, giving them all a good smoking before uniting and afterwards, also if there is any tendency to fight, which there is little chance of, unless the bees have been unduly disturbed.

QUERIES.

QUERY No. 21.—In front of several of my stocks there are large numbers of dead bees; some are seen fluttering on the ground in front of the hives, and trembling; they ultimately die, and many dead or trembling bees are brought out from the hive and thrown out. The bees have much diminished in the hives. What is this disease, and what is the best remedy to use?—PHILOMEL.

Artificial Pollen.—After the late severe winter, natural pollen cannot be expected to be very plentiful. In the olden times if bees could not get pollen from the flowers, then they had to go without. If, however, we can assist Nature without endeavouring to set aside Nature's laws, then it seems only right to do so. A gentleman, who lived near a windmill, found that his bees were constantly visiting the mill and returning again to their hives. After watching them for some time he paid a visit to the mill, and there he discovered his bees floundering about in the flour and carrying it away. He found that the reason was that natural pollen was scarce. As we do not all reside in the neighbourhood of windmills, and for various other reasons, it is desirable to give the bees flour nearer home. It has been discovered that the best kind of flour to give bees is pea-flour. Get a large pan with a few shavings at the bottom, then sprinkle the pea-flour amongst the shavings and place it in the neighbourhood of the hive; the bees may be a little while finding it out; so to draw their attention to it, point it out to them by means of their noses, *i.e.*, put some sweet syrup in a piece of comb and put it in the pan; if you have a small quantity of honey to spare, so much the better. When you have once commenced, do not leave it off till there is plenty of natural pollen. I have mentioned in a previous article how to supply bees with water. Give them water at once. —WALTER CHITTY, *Gardeners' Chronicle*, April, 1886.

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THE Australian Beekeepers' JOURNAL.

Vol. I.—No. 10.]

OCT.—NOV., 1886.

[PRICE 6D.]

EDITORIAL.

AUSTRALIAN BEE NEWS.

WE are now fairly landed on the new season, and, as a rule, we have promising reports from all quarters. The weather about Melbourne has not been favourable for swarming, but on every fine quiet day lately swarms have issued. Our friends in South Australia are quite three weeks in advance in this direction, and we have received reports of a very busy time there with bees, beekeepers, and hive manufacturers. One manufacturer, we are informed, has sold over a thousand hives this season. Our own importers and manufacturers of apian appliances are also very busy, and the beekeeping industry in Australia seems to have received a marked impulse.

An effort has again been made to import new stock from Europe, and a large consignment of Cyprian queens for Australia arrived in Adelaide about a fortnight ago. Those for Adelaide beekeepers were delivered on arrival of the s.s. *Orient* in September, and were all alive and well. One package for Hamilton (M. H. Naven) reached its destination about five days later with three out of eight dead. Another, for Melbourne, arrived eight days later with three out of four dead. An unusual and inexcusable delay occurred in delivery by the carriers after arrival in Adelaide, and had Mr. Benton made the separate consignments to each colony, instead of all to Adelaide, there is every reason to believe all the queens would have arrived alive, unless, as may have probably been the case, the presence of the European bee moth in most of the compartments, and consequent burrowing of the grub

through the honeycombs, allow the honey to trickle out, and so daub and ultimately kill the bees. However, a fine lot of Cyprian queens are installed at Adelaide, from whence, no doubt, the breed will soon be obtainable. The failures in this case are not after all great, considering the length of voyage and long time the bees are imprisoned, and no doubt Mr. Benton, of Munich, profiting by this experience, will on the next occasion be able to avoid what have, in this instance, been causes of failure. Some queens were consigned to Queensland, but we have not yet heard of their arrival or the mortality among them.

Cyprian bees are very like the Ligurian, and only distinguishable by certain markings beneath the thorax and abdomen; the ordinary observer can observe no difference in appearance. This breed is credited with great breeding and gathering qualities, being very hardy, somewhat vicious, but a grand race of bees. Probably the first progeny in Australia will be queens—the produce of Cyprian mothers mated with Italian drones—a breed that is much extolled in Europe and America; and we hope to hear before very long that our friend Mr. Bonney, of Adelaide, has succeeded in rearing good bees of this strain.

Further misfortune attended the queens sent to Victoria, for some of those that survived have been lost in introducing to queenless hives since their arrival.

A few Carniolan queens are expected in Melbourne, from Europe, very shortly, and we hope an opportunity will thus be afforded of testing this species of bee in Australia. While, undoubtedly, the gentlest and most amiable of all the races, gaining them the name of the "*Ladies' bee*," excellent honey gatherers,

building snow-white comb, and using no *propolis*, they are accused of being over fond of swarming, which, of course, is a great objection with those keeping bees for profit. However, a change of climate may possibly alter this propensity, and it is fully worth while seeing how the crosses with Italians or Cyprians will do for Australian climates. The Carniolan is very like the black bee, with a lot of silver down on it.

Among the now numerous convenient inventions for beekeepers, the *Alley drone trap*, or *swarm arrester*, is likely to prove of the greatest value to those who don't care about losing swarms. This arrangement is a little movable porch to go in front of the hive on the entrance. It is closed with zinc, perforated with oblong holes large enough for the worker bee to get through quite easily, but too small for drones or *laying queens* to get through. The porch has an upper storey, which can be entered from the lower one through two cones of fine wire net, with holes in their apex large enough for queens and drones to get through easily. When once in the upper storey they are caged, for, although they could go back the way they came, they never do, because the way out is on the *top of a cone* or pyramid, and bees seldom or never enter an opening situated at the end of a cone or tube. Now if one of these "traps" is on a hive when a swarm issues, all the bees get through the zinc front, but the queen cannot, and she crawls up through one of the cones into the upper storey of the trap, and is thus caged; the bees soon find she is not out, and cluster around the cage, from whence the swarm is easily taken. Mr. Bonney, of Adelaide, writing to us his experience of these useful little arrangements, says:—"Do you use the Alley drone trap? It is a capital invention. I keep one on each of my pure Italian colonies during swarming time, and can then go to business without any fear of loss of swarms. If the bees swarm, the queen goes into the trap and remains there with the swarm hanging about the hive till I come home in the evening, when matters are easily arranged."

Mr. Alley himself says:—"You can go to church on Sundays in swarming time without thinking of your swarms all prayer time."

PROCEEDINGS OF BEEKEEPERS' ASSOCIATIONS.

Victorian Beekeepers' Club.

THE eleventh meeting of the Club was held on Monday, 11th September, at 8 p.m., at the

rooms of the Victorian Public Service Association, Melbourne Athenæum. Fifteen members present; Mr. Ellery in the chair. There were numerous exhibits of beekeeping appliances, racks, frames, hives, &c., and specimens of new or little known bee flowers.

Frames with combs from hives showing signs of disease were brought by some members with the view of eliciting information.

The following papers were then read by the Chairman:—

QUIETING BEES WITH CARBOLIC VAPOUR.

Bees, like human beings, are quieter when full of food than when empty, so that all methods of quieting bees aim at inducing them to gorge themselves without otherwise injuring or unduly alarming them. Anything that alarms the bees or produces commotion in the hive will induce gorging, if they have any honey; if they have not, you cannot quiet them except momentarily, unless you give them the means of gorging by sprinkling syrup or honey and water over them. Drumming or bumping the hive, puffing tobacco or any kind of smoke among the combs all do well for this purpose; but tobacco smoke, unless sparingly used, makes the bees very giddy for a long time. It is usual, therefore, to use only the smoke of rags or decayed wood, which is most conveniently obtained by aid of a bellows smoker, of which there are various forms. Notwithstanding the utility of a bellows smoker, every beekeeper has experienced the annoyance of time lost in getting up a fire in his smoker when in a hurry, no rags or rotten wood to be found, or if found, perhaps not dry; or no matches at hand; or, worse than all, in the middle of some manipulation, the bees get very vicious, and you find *the fire has gone out*. Lately some apiarists in England have made experiments with different cold vapours such as crude carbolic acid, creosote, ammonia, &c., and apparently have met with great success. I have tried some of these methods, and am glad to say with very marked advantages. I have here a bellows smoker, with a little chamber for forming the vapour. Into this chamber I put a little sponge, on which is placed thirty to sixty drops of a mixture of creosote and common oil of tar (one part of creosote to ten of the black oil of tar.) When this is closed up, and the bellows worked, the air passes through and gets impregnated with the tarry vapour. By gently blowing this vapour on to the tops and between the frames, the bees run down quickly and fill themselves. A very little seems to do all that is required, and indeed very little should be used. I find that, by lifting one corner of the mat

over the frames, and gently blowing under it as I peel it off, the bees are quieted immediately. None should be blown in at the entrance, and very great care must be taken that the sponge is never sufficiently wet with the mixture to allow of any running towards the nozzle, and so dripping among the frames, or your bees may all leave. The advantage of this plan is, the "smoker" is always ready—one charge has lasted me three weeks—and it is easy to wash out the sponge and put a little fresh mixture in. If one has an ordinary smoker he can get a little wire net cage made to hold the sponge, and fit into the fire chamber, or he can buy one of the little *wire net tea holders* for holding the sponge inside his smoker. Pure carbolic acid the bees don't mind much, but crude acid is very alarming to them. Now crude carbolic acid is a mixture of phenol (pure carbolic acid,) cresol, and other tarry substances; and as the cresol and other impurities seem to be the effective ingredients, it is best to use those alone. So I have used a mixture, as stated above, of cresol and black oil of tar (one part in ten,) which seems to do admirably.

FIXING FOUNDATION IN WIRED FRAMES.

The methods usually adopted for fixing foundation in wired frames are either to rub the wires into the foundation with a *grooved butter hook*, or some tool of the kind, or to press it in with "*Boyd's roller*" (an American device,) or, better, with Mr. Root's "*racking tool*," an instrument like a portion of the periphery of a wheel, with a few sharp teeth on it. Each tooth is rolled on to the wires, and embeds them in the foundation. Foundation fixed by any of these methods is apt to part from the wires and curl up in very warm weather, or when used for newly hived swarms. The fact is, there is no real union between the wax and the wires unless the wires are heated. I have tried several plans for doing this, but none so satisfactory as warming the wires with a galvanic current from a good large single battery cell. The mode is very simple. Lay the foundation on a board which fits inside the frame; now lay the frame horizontally over the foundation, so that the wires lie over and evenly on the foundation; take the wires from the two poles of the battery, one in each hand and touch the two ends of each wire, wire for a moment, one end with the positive and the other with the negative wire of the battery, and the frame wire becomes heated, and melts its way down to the *bottom* or *middle* of the foundation; touch each wire of the frame in succession in this way, and the whole is fixed quicker than by any of the other modes, and so firmly that you can only tear the foundation

away piecemeal. If your battery is not strong enough to heat the wire the whole width of the frame do it in steps, and you will find even then you can do it more quickly than by any of the other plans, with the satisfaction of knowing that the wires are as firmly attached as is the case with the foundation where the wires are embedded during the process of manufacture.

The eleventh meeting of the Club was held at the rooms of the Public Service Association, Melbourne Athenæum, on 18th October. Fourteen members present; Mr. Elvey in the chair.

Mr. F. Bowyer Miller described an observation he had made, and his first experiment for ascertaining the time bees commenced queen cells after being made queenless. In the first case a cell was completely formed in twenty-four hours. The Chairman was asked if queens reared in very small colonies were as prolific as those raised in full colonies? In reply, he said that queens raised in small or weak colonies seldom proved prolific or long-lived. Small colonies therefore should not be allowed to build their own queen cells. Capped cells from strong stocks should be given to small colonies.

The Chairman stated that a rather large consignment of Cyprian queens had arrived in Australia from Mr. Benton, of Munich,—some for South Australia, some for Victoria, and others for Queensland. Those for Adelaide were opened several days before any of these for Victoria reached their destination, and were all alive and well. Eight went to Hamilton for Mr. Naveau, three of which were dead on arrival. Four came to himself, of which one was dead, two nearly dead, and one alive and well, which was introduced to a colony of blacks next day in a pipe corner cage (the black queen having been just removed). She was released next day, and at first was well received by the bees, but was afterwards killed. On releasing her she took flight, settled a moment on his hand, and then rose again and flew rapidly away, and was lost. Mr. Naveau, he stated, had also been unfortunate in introducing, but he believed that two or three were safely installed. He attributed the death of the queens on their voyage to the presence of moth in the small boxes, which had caused the bees to dip out from the comb, with which the bees were ultimately solicited. Several specimens of *small* bee flowers were shown by members, and specimens of American bees in the flat, just arrived, were exhibited by Mr. Lloyd.

The meeting terminated at 10 o'clock.

CORRESPONDENCE.

"APIS" REPLY TO MR. ABRAM.

(To the Editors of the *Australian Beekeepers' Journal*.)

GENTLEMEN,—I am afraid the controversy between Mr. Abram and myself, respecting the relative merits of the Berlepsch and Langstroth hives, is taking up rather much of your valuable space, but as it is a matter of the first importance to beginners that they should adopt, at the outset, the best hive, the discussion may not be without a value to them.

After carefully reading Mr. Abram's letter in the August number of this journal, I conclude, first, that he must have thought I was reflecting on his ability as an apiarist in my reply to his article on the Langstroth and Berlepsch hives; second, that he has not answered the main points in my argument; and third, that he has made a series of mistakes through his letter, and bases his argument on them.

Let me first assure Mr. Abram that I had no idea of questioning his ability. On the contrary, I look upon him as an able bee-master, but at the same time I do not suppose he is, any more than the rest of humanity, above falling into error, or being prejudiced in favour of the particular appliance he has been accustomed to use, and therefore blind to its faults. Mr. A., at the commencement of his letter, says:—" 'Apis' undertakes the task of comparing the Langstroth and Berlepsch hives." I only followed Mr. A. in this "task" in order that beginners should see both sides of the question discussed, for it is only this class that might be led into the adoption of any particular hive by a one-sided argument. I have no fear that the experienced beekeeper may be induced by any kind of argument to supersede the Langstroth with the Berlepsch. Had Mr. Abram confined himself simply to a description of the Berlepsch hive, and his method of working it, without trying to enhance its value at the expense of the Langstroth, there would have been no need for my reply, which apparently he did not expect. Mr. A., in his first paragraph, assumes that I have "not the slightest idea of the Berlepsch hive; that I have not worked it side by side with the Langstroth, and therefore can have no practical knowledge of the matter," and then proceeds to argue on this assumption. Does Mr. A. mean to tell us that it is impossible for any experienced beekeeper to form a fair estimate of the advantages or otherwise of any particular form of hive as compared

with another, without first testing them side by side? We should get on very slowly if our common sense did not guide us thus far. I must, however, correct error number one, for I have used hives exactly similar to the Berlepsch, with the exception that the frames of the brood chamber ran from back to front instead of from side to side. There was the one tall box, divided off by a partition, with slides in it. The movable back from where the manipulating was done, the glass back inside the wooden one, and everything, excepting the position of the frames, the same as the Berlepsch. I suppose Mr. A. will consider this near enough for all practical purposes. This hive, I daresay, is not entirely unknown to other Australasian beekeepers. It is called the "Harbison hive" after a prominent American beekeeper who was using it some years since. The first I had was made from one imported from America by Mr. Mr. G. S. Graham—now of Wellington—in 1876, which, after a trial of two seasons, I discarded in favour of the Langstroth. In September, 1882, I bought, for the sake of the bees in them, a dozen such hives from Major Jackson, of Waikato. I did not transfer the bees from all of them at once, but worked four of the hives through that season, with the result that I became more than ever disgusted with them. I still have a number of those hives, but not in use.

Perhaps Mr. A. will now admit his error, and allow that I had some practical knowledge of what I was talking about. But how about the other side of the question? Has Mr. A. ever worked the Langstroth? He does not tell us that he has.

In the second paragraph Mr. A. proceeds to sustain his former argument about bees in a state of nature selecting particular shaped hollows in trees, but he does not say one word against my statement that there can be no other shaped hollows for them to select from, so that as regards this I have nothing to reply to. Further on, he takes exception to what I said in reply to his theory "that the nearer we approach to their (the bees') natural habits the more likely are our arrangements to be successful," and says, in answer to what I pointed out as working against the natural instincts of the bees, such as making swarms, suppressing or checking the swarming impulse, forced queen rearing, controlling the breeding of drones or workers, that in doing these things we are not working against but assisting Nature.

This appears to me a very curious line of argument. Nature requires no assistance; she works her own ends in her own way, which does not always suit us, therefore we take our own course and assist ourselves,

using Nature as a sort of motive power only in gaining our own ends. Does not the word "artificial," made use of by Mr. Abram to denote certain kinds of swarms, indicate that they are *not natural*? Look at the result of select breeding in all our domestic animals, and say whether we have laboured to assist Nature or to assist ourselves? Most decidedly the latter, and in doing so we have had to fight hard against Nature, ever looking forward to some ideal standard as our goal.

I hardly know what Mr. Abram means when he says: "If anyone wants to rear pure queens of a certain race of bees, and kills the hybridised queens to rear others again in the hope to be more successful at the next attempt, does he kill them and rear others in order to work against the natural habits of the race of bees, or is it the nature of the bees to hybridise? Certainly not. The queen breeder only assists them in keeping the race pure." If he means that cross-breeding between queens and drones of different varieties is unnatural, I would ask him how it is that it comes about in a natural way? The words hybrid and hybridise are here used out of place. A hybrid is the production of two species—a mongrel. There are many varieties of the true honey-bee, but only one species—*Apis Mellifica*. It is perfectly natural for the different varieties to cross breed, and any steps the queen breeder may take to prevent cross-breeding is forestalling or working against Nature, and is done with the view of benefitting himself, not to assist the bees. What care they whether they cross breed or not? Most certainly it is *unnatural* to kill queens simply because they have not mated as we wished, but it is profitable, and we do it without any other thought.

In the fourth paragraph Mr. A. begins by saying that "the long shallow frame is an absolute necessity for a hive that opens at the top only," which tends to show that he has either written this sentence without a thought, or that he knows little or nothing about this kind of hive. What is to hinder anyone, if he so wished, using a tall narrow hive opening at the top? Nothing. Why, three of the principal hives that were used before the Langstroth took their place, were of this description. The "American" took a frame 12 in. by 12 in.; the "Galup" one, 11½ in. by 11½ in.; and the "Adair," 13½ in. by 11½ in. The long shallow frame has been now generally adopted in America and other places simply because it was found to be an improvement on the others. Mr. A. speaks of risk of injury to bees, &c. Is there not more or less risk when handling the frames in any hive? Certainly, and the risk is much greater

where you can only see one side of the frame and comb as you take it from or replace it in the hive. Again he falls into an error by assuming that I only keep "black and hybrid bees," and argues from that standpoint against the size of the Langstroth and in favour of the Berlepsch broad chamber. I can inform Mr. A. that I have worked *pure* Italians for the past five and a-half years, many of the queens coming direct from Italy. Yet again in error, when he says that two storeys (supers) of the Langstroth hive give room for nearly 150 lbs. of honey. Now the utmost that can be crowded into one full storey is 56 lbs. of comb honey and about 60 lbs. of extracting, which gives 112 and 120 lbs. respectively for two storeys. Mr. A. asks why two or three storeys are required? I must refer him to some modern work on bee culture for an answer to this question, as my letter has now reached a length considerably beyond what I anticipated. At the conclusion of the paragraph he says: "Few are the objections 'Apis' has raised against the Berlepsch hive which I have felt it my duty to reply to." This is self evident, for he has not replied to a single material objection raised by me, so where is the use of his letter? It is simply a reiteration of what he said in his article.

Mr. A. appears to have a very special strain of Italian queens, such as I have never heard of before, that "breed fast in spring," when but a limited amount of honey is to be had, and "decrease breeding" as soon as plenty can be gathered. They certainly must be extraordinary queens, for the general rule is in the opposite direction; but as four or five frames, full of honey from top to bottom, can be taken occasionally from the broad chamber of his hive, as Mr. A. tells us, there seems to be no mistake about it. I have always been under the impression that one of the distinct advantages in the cultivation of Italian bees is the extra prolificness of the queens compared with those of the black variety, and I have found it so, but Mr. A. must remember that we are not all in possession of such queens, and therefore we require a different hive to the one he is using. Now, let us see what amount of breeding space is left in the Berlepsch hive after five combs in the broad chamber are filled with honey. Each broad frame contains 121 square inches, which, multiplied by 50, the number of worker cells to an inch on both sides of the comb, gives 6050 cells. This again multiplied by five, the number of frames left for breeding in, gives 30250 worker cells.

This is the full number that can be built with five Berlepsch frames, but there are usually odd corners in all frames that are not

filled in, and there is always more or less honey stored in the upper parts of the brood combs, so we may fairly reckon that at least there will be one-eighth of the space not available for breeding in, which would reduce the number of actual brood cells to 26,469. Dividing these figures by twenty-one, the number of days occupied in the maturing of worker bees, we get the average number of eggs laid per day, which will give us some idea of the value of these extraordinary queens as breeders. In reckoning this, I have not taken into consideration the breeding of a proportionate number of drones, which take three days longer to mature; had I done so, the average daily number laid would be still less. We now have 1260 as the number, that is, according to Mr. Abram's statement. Surely there must be "something wrong somewhere," for all the best authorities tell us that a queen to be worth keeping should lay over 2000 eggs per day during the height of the breeding season, and that period is *when most honey is being gathered*.

I notice that Mr. C. Fullwood, of Brisbane, in a letter published in the April number of your journal, has raised exactly the same objections to the use of the Berlepsch hive that I have, and he moreover says that it "has been used in all the colonies and abandoned mostly."

The experience of Mr. H. Naveau with the Berlepsch hive, as given in the August number, fully corroborates what I said with regard to the bees propolisising the ends of the frames in the grooves. If Mr. N. considers the open space over the brood-nest an advantage in winter, he has only to put an empty super on his Langstroth hive to get it.

In conclusion, I may say that any remarks Mr. Abram may think proper to make on the second part of my reply to his articles I will willingly answer if necessary, and with your permission, but as regards the first part I am now done with it.

APIS.

New Zealand, 23rd September, 1886.

(To the Editors of the Australian Beekeepers' Journal.)

GENTLEMEN,—Being under the impression that you invite correspondence from beekeepers through your journal, I apply to you hoping you may be able to help me in my present trouble. Hoping to become a successful beekeeper, I (when in Brisbane in May last) bought a swarm of Italians from Mr. Chas. Fullwood, and brought them here. Fearing the weather during the winter would be too cold for them, I packed the whole hive

in chaff, including chaff, cushion, &c. They wintered very well, as far I could see. This day week I transferred the five frames I brought from Queensland into a new hive having five other frames of foundation already in it. The bees still seemed to do well, but during the past three days they are dying off in hundreds. They seem to be able only to reach the alighting board, from which they roll off; their bodies become greatly distended; they struggle for a time and die. Can you inform me what is the matter with them, and what the remedy? Anxiously looking for the next issue of the journal, I am, &c.

THOS. DEAN.

Bay-street, Brighton, 25th Sept., 1886.

[Our correspondent's bees were no doubt attacked with the disease by some called "virtego," by others "distended bee disease," and by some of our American brethren, "the unnamed disease." It has appeared in our apiary this spring in two hives, one of which has developed foul brood in a mild form, and it becomes a question whether the first disease may not sometimes be a premonitory symptom of the latter. It would therefore be well if our correspondent would examine the combs from time to time for any signs of this troublesome plague.—ED.]

(To the Editors of the Australian Beekeepers' Journal.)

DEAR SIRS,—I am a beginner at beekeeping in frame hives. If you would answer my question in your journal I should be obliged. My bees will persist in building drone comb. I wish to give them full frames of foundation comb; my frames are eleven inches square, inside measurement. Could you tell me how to wire them to prevent the foundation sagging, so that no cells shall be large enough for drones; also the best size of wire to use?

Clarence River, N.S.W.

G. G.

[G. G. will find it difficult to avoid stretching of foundation in frames eleven inches deep without wiring, especially in warm weather; the result of stretching will of course be a superabundance of drone cells. The wire to be used should be about twenty-eight or thirty gauge, and *tinned iron wire* is best, although we have found common iron wire of that gauge answer very well. To wire a frame you must pierce the top and bottom frames with a sharp Bradawl, beginning at such a distance from the end of the top bar that the first wire shall be about one inch from the inside of end of frame; the wires should not be more than $2\frac{1}{2}$ inches apart, and, for a frame eleven inches inside measurement,

five wires will do, which will bring them about $2\frac{1}{4}$ inches apart. Pierce the top bar with five holes along the centre, the outside ones being an inch inside ends of frame, and rest equidistant about $2\frac{1}{4}$ inches apart. Pierce bottom bar the same. The length of wire for each frame will be 69 inches. First drive a small tack (not quite home) near the first hole of the top frame, lace the wire from the top down then up, and so on till you end at the bottom. Drive another tack here, and turn the wire once or twice around it and then tighten up from this back to the commencement where the wire is fastened to the first tack driven, and the frame will be wired. Don't strain the wires tight, or the top and bottom of frames will be bent too much; strain only tight enough to get all bends and absolute slackness out of the wire. Straightening the wire is facilitated by rubbing a piece of round hard steel along it; the side of a bradawl does well for this. There are numerous ways of fastening the foundation to the wires, and unless it is done well it often drops away from the wires and falls down. Get a board that will fit inside the frame, and, having the foundation pretty warm and soft, lay it on the board, and on it the wired frame. With a small blunt screwdriver across the wires press them into the wax at every inch or two of their length. The plan described in the present number at the Victorian Beekeepers' Club meeting is the best and most expeditious, but requires a good galvanic battery. —L.D.

NEW BOOKS, REVIEWS AND EXTRACTS FROM FOREIGN JOURNALS.

USING SO AS TO MAKE THE BEES STAY IN THEIR NEW LOCATION.

In the evening when the bees are all in the hive, we unite the two in the ordinary way. At the time we do this we reserve a frame of unscaled brood, and place it back in the hive whence it came. This is done to catch a good many of the old bees, which will be sure to return to their old home. Scaled bees and the frame of brood are allowed to remain in their old home from twenty-four to forty-eight hours, during which time the new order of things, together with the loss of their queen, seems to disorient them, and puts them in a condition to accept any circumstances whatever. At the expiration of a day or so this frame of brood and bees are put back in the colony in the evening where they were first placed. We find in practice that this second returning is pretty sure to

make all the bees stay, though sometimes perhaps a dozen old worn-out fellows (not much use) are so welded to their old home as to go back again even then.

When uniting into chaff hives we find it quite an advantage to put all the bees of the new colony on combs in the upper storey, just above the colony already occupying the hive. The brood is placed below in the body of the hive. It will then be a couple of days before the bees in the upper storey will go below. When they do they will be more apt to stay in their new location. The returning bees are then caught as before. —Root's *Gleanings*, September, 1886.

FOUL BROOD, AND ITS MANAGEMENT.

Discoursé par Prof. M. L. de la U. S. Agricultural Station.

Mr. E. R. Root:—Your father told me last week that you were having some trouble with foul brood. I told him that I would send a prescription for the cure of foul brood, and also a prescription for use as a preventive.

Take of soft water, three pints; of dairy salt, one pint. Use an earthen vessel. Raise the temperature to 80 deg. F. Do not exceed 90 deg. Stir till the salt is thoroughly dissolved. Now add one pint of warm soft water in which has been thoroughly dissolved four tablespoonfuls of bicarbonate of soda (use the crystal.) Stir thoroughly. Add to this mixture sufficient sugar or honey to sweeten it, but not enough to perceptibly thicken it. Now add $\frac{1}{4}$ oz. salicylic acid. Merritt and Co., of Cincinnati, make a pure salicylic acid from the oil of wintergreen (Kohl's solution of salicylic acid No. 1.) Mix thoroughly. Let this mixture stand for two hours, when it becomes settled and clear.

Treatment.—Shake the bees from the combs, and extract as clean as possible. Now thoroughly amuse the bees, using the mixture and a large atomiser. The atomiser will make a good one for twenty-five cents. Return the frames to the colony.

If there is no honey to be obtained from the fields, feed honey or syrup to which has been added three tablespoonfuls of the mixture to each quart of honey or syrup. Stir well. The honey just extracted may be used without injury to the bees, if the mixture is added, but no more should be furnished than is consumed. Amuse the colony two or three times more, empty setting the frames apart so as to direct the spray well over the combs and back—not brushing off the bees, three or four days would intervene between the times of treatment. The last may be given on top without removing a frame.

As a preventive, apply on top of the frames, or in any way by which the bees may get it. Also burn old dry bones to an ash, and pulverise. Mix up a gallon to each fifty colonies in the apiary, of the above mixture, adding enough sugar or honey to make it very sweet (say two or three times as much honey or sugar as would be a proper quantity for use in the atomiser.) Stir in a full half-pint of the powdered bone ash. Place this gallon of mixture in, say, four shallow vessels—perhaps bread-pan feeders with floats on top—and stand these four in different parts of the apiary. You will be surprised at the rapidity with which the depleted colonies will recuperate and grow strong again.

If you fear that the exposure of sweets in the apiary will induce robbing, the mixture can safely be fed the customary way on top of the frames in the hive.

I would recommend that you give the entire apiary one application of the mixture prescribed for cure, as this treatment frequently prevents the presence of the disease where it was not before possible to detect it.

The quantity prescribed for use by means of the large atomiser is sufficient to treat 150 colonies. Not reckoning the sugar or honey used, the cost will not be more than fifteen cents. I have prescribed this treatment with entire satisfaction and uniform success for the past two years.

I will mention the facts in two or three of the apiaries for which I have prescribed this treatment.

1. Number of colonies in the apiary, 46; number apparently diseased, 13; number actually diseased, 28; disease so far progressed that the stench was very offensive in the yard; bees crawling out of hives to die by tens of thousands; effect of treatment apparent in one day; a permanent cure in each case.

2. Number of colonies, 60; serious cases, 38; combs black and putrid; a few had already been burned; effect of treatment apparent at once; a permanent cure in each case.

3. Number of colonies, over 150; number of colonies diseased, 60; bees swarming out; stench from hives nauseating; combs black and rotten; brood putrid; whole apiary treated; disease immediately arrested; effect of treatment on affected colonies instantaneous, even on apparently hopeless cases; every colony cured; disease eradicated, leaving no trace behind. Colonies soon all strong, healthy, and prosperous. For the purpose of further experiment, the combs of healthy and diseased colonies were exchanged; combs from diseased colonies being given the healthy colonies, and the combs of healthy colonies placed in the diseased colonies. The treatment was applied to both alike. In every

case the disease would immediately disappear, and in many cases the diseased colonies were soon more populous and prosperous than those which had had no disease and had been undisturbed.

This treatment, which is simple, cheap, and easily and rapidly applied, seems to be efficacious in the most virulent forms of foul brood, and seemingly furnishes immunity from the dreaded scourge.

N. W. McLAIN.

Aurora, Ill., 6th August, 1886.

P.S.—The remedy for foul brood—the formula for making and applying, which I sent you, effectually eradicates the worst cases in about twelve days, without the cleaning of a hive or melting of a comb. I am glad to hear that you have no need for it in your apiary. The disease described in GLEANINGS, as being in your apiary, is, I think, not foul brood. If you have any more trouble with it I can tell you what to do.

N. W. M.

U.S. Apicultural Station, Aurora, Ill.,
17th Aug.—Root's *Gleanings*, Sept., 1886

ROBBING.

As the honey flow ceases, the danger of robbing comes on. The same cautions must be given as have been repeated year after year, to avoid giving bees any taste of food except in their own hives. If once they get it they will search about for further supplies. On no account put down broken combs, cuttings, &c., for the bees to clear out; this is a fruitful source of robbing. Always give them behind the divider, or in some way so that the bees to which they are given alone have access to them. If feeding with syrup, be careful not to spill it about. Use a feeder which cannot be robbed. Reduce the entrances of weak hives with strips of perforated zinc. This is better than wood at this season when free ventilation is still required. Robbing is often started by late extracting. If an attack upon any hive has commenced, the plan of placing glass before the entrance will generally put a stop to the inroads of the raiders. A piece of glass of sufficient length and width to cover the entrance is provided, the lower edge of which rests upon the alighting board, one inch from the hive, and the upper edge on the front of the hive. This will enable the bees of the hive to go in and out at the sides of the glass, but the robbers, attacking, fly straight for the entrance and are suddenly checked and daunted by coming into contact with the glass, and if the attacked colony be fairly strong, they will not allow them to enter at the sides.—*British Bee Journal*, Sept., 1886.

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JOURNAL

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THE Australian Beekeepers' JOURNAL.

VOL. I. NOS. 11 AND 12.

FEBRUARY, 1887.

[PRICE 6D.]

EDITORIAL.

THE present double number completes the first year of the *Australian Beekeepers' Journal*. Our readers have already learned that the subscription list for the year has not come up to our expectations, and without a very considerable increase, is not sufficient to warrant our carrying on the Journal (at least as a monthly publication,) for the present year. We have received numerous letters lamenting the prospect of the discontinuance, testifying to its value and interest to beekeepers generally, and in some cases sending the names of new subscribers. It will be a matter of regret to us, if, for want of sufficient support, we are compelled to stop issue, and we are now simply waiting to see what subscription list we can rely upon before entering upon Volume 2.

BEE NEWS OF THE SEASON.

IN most districts in this part of Australia, the first honey-flow slackens about Christmas, and bees get hard pushed for fodder until the Eucalypts and other autumn flowering trees and plants begin to open out towards the end of January or beginning of February. At such a time beekeepers have to see to their stocks and feed freely if any are short of honey. Late swarms are seldom sufficiently advanced to do without some help, and strong stocks, whether they have honey or not, will make large efforts to get "honestly if they can," but get it they will, and therefore robbing is to be carefully guarded against, or weak stocks which have honey or get fed are liable to raids from their stronger neighbours. It is not easy to cure robbing when once commenced at

this season, and stocks robbed will surely be ruined if it is not stopped. Finding out the robbing hive and changing its place with the robbed one, will often cure the difficulty; but this is not always practicable, nor is it always successful. Removing the robbed hives a full mile away until the honey is flowing again is probably the best cure. Prevention, however, is the proper course. Where robbing occurs, it is nearly always caused by carelessness, when honey is scarce. Opening hives on bright days, unless early in the morning or late in the evening, diffuses the odour of honey, and sets the robbers on the alert, when they try the strength and courage of the hives opened, and if once a few bees can carry off a load or two of honey they will fight till half the bees are dead to get the rest. Outside feeding, leaving honey or comb about, spilling honey, or feeding with honey, even when it is done inside the hive, often starts robbing. It is best, therefore, when little or no honey is coming in, to open hives, but seldom, and then in the early cool morning or late evening; and never to feed with honey, but simple sugar syrup. Extracting should be done earlier or put off later, and removing section boxes should be done either early or late in the day, and the sections themselves placed in a room inaccessible to the bees. Italians and hybrids are apt to rob weak black bees, but we have found Italians and first crosses, however weak, always repel the first attempts of thieving bees. A queenless hive is almost sure to be attacked if robbing commences.

News from the country districts show the present to have been a variable season according to locality. Bees having access to meadow and clover pasturages appear to have stored well, and in some places an extensive early

blossoming of some of the Eucalypts has given a good harvest, while in some generally good districts the returns have, as yet, been considerably below the average. Mr. Naveau, at Hamilton, says, 10th January: "The honey is coming in abundantly," but from what source he cannot tell, as no honey flowers were then to be found in the neighbourhood.

The Cyprian queens Mr. Naveau imported, and which he at first thought he had lost in introduction, have become thoroughly established. He has now three imported Cyprian queens established at Hamilton, besides one he disposed of; and from these he has had swarms, and has now six young Cyprians laying. He states they are difficult to manage at swarming, as they have no respect for orthodox times; one swarm came out at 7 a.m., another at 5 p.m.

Beekeepers must now keep a good look-out for the appearance of foul brood, for it often comes on just after the first honey flow is over. We were sorry to hear of its appearance in Tasmania a few weeks ago; hitherto we believe the "little island" has been free from it. The numerous *cures* all seem to fail one after another, and prevention seems almost impossible. We have carefully collected evidence from experienced beekeepers in several parts of Australia, and the result appears to be that the "new hive" method is the most successful; that is, putting queen and all the bees into a new hive with full frames of foundation, and feed freely with syrup, to which a little salicylic acid is added (syrup 1 quart, salicylic acid 30 grains, dissolve salicylic acid in spirits of wine and stir it into the syrup.) The bees should be brushed from the old combs into a box that can be covered up for an hour or two, and in the evening allowed to run into the new hive on the old stand. The old combs and frames had better be burnt in a good fierce fire, so no bees can get any of the honey from them during the burning. The main points are:—1st. To prevent the disease spreading to other hives. The obvious way to do this is to prevent other bees from entering the diseased hive or getting at any of the combs or honey, and also to prevent bees from the diseased hive entering healthy ones and carrying the contagion. Therefore, while brushing the bees from the combs of the diseased hive, the entrances to all the other hives must be closed up with wire net or perforated zinc, or some of the bees will beg their way into the healthy hives. The night before you shift the foul-broody bees, close up the entrances of all the other hives in the apiary and get your bees from the diseased combs into the covered box very early next morning, before any of the bees are out, and open up the closed entrances later in the day.

2nd. To stop the disease in the colony itself. This is done by giving them a clean hive and new combs to build from clean foundations, and feeding freely with sugar syrup rendered somewhat antiseptic by the addition of salicylic acid. It is all the better to keep the bees in the covered box, which must be well ventilated, in the shade, until the evening, when the box may be shaken a bit and opened so that the bees may easily crawl into the entrance of the new hive.

PROCEEDINGS OF BEEKEEPERS' ASSOCIATIONS.

South Australian Beekeepers' Association.

THE monthly meeting was held at the Chamber of Manufactures on Thursday evening, 9th December. Mr. A. E. Bonney presided. In answer to a letter from Mr. C. J. Coates, it was resolved that the prize-list passed last June should be that for competition at the Royal Agricultural Society's Show during March next. Several applications for Ligurian queens were dealt with, and it was resolved that all engagements made should be carried out, but that as Ligurian queens can be purchased at low prices from professional apiarians, the Society would give away no more queens. It was resolved to purchase a bookcase as soon as funds would permit, also to endeavour to collect specimens of all known bees, wild and domesticated, found in South Australia, and to have the same mounted and exhibited in a case.

Mr. A. Molinoux then read the following paper:—

THE WILD BEES OF KANGAROO ISLAND.

When, at the instigation of the South Australian Chamber of Manufactures, the Parliament passed an Act which reserved the extensive tract of land known as Kangaroo Island for the propagation of the Ligurian bees, there was probably not an apiarian on the face of the globe who would find fault with the legislation which secured for this most valuable variety of bee a home where it could be raised without the slightest chance of hybridisation with any other kind. The island is a little over one hundred miles long, and is over forty miles wide for a good distance, with a probable average width of twenty-five miles. The nearest point to the mainland is in the vicinity of Hog Bay, where the passage is over eight miles wide, and it is seldom that there is not a breeze of sufficient strength to prevent the flight of drones across from the

in to the island if there should ever be any venturesmen enough to attempt the trip. Such a reservation as this, by Act of Parliament, is probably unique in the annals of apiculture, and our beekeepers flattered themselves that they would be able to supply the world with guaranteed pure Italian queens against which not the slightest suspicion of taint could be brought.

It can easily be imagined how shocked were our beekeepers when Mr. Allerdale Grainger, M.P., returned one day shortly after the Act was passed, after a trip to the island in a vain search for tin lodes, and reported that the island was swarming with wild black bees, escaped from cultivation. To myself the news was strange, because I had seen a good deal of the island, but had noticed nothing more nearly resembling our common black bee than the blowflies, of which there are myriads, which especially frequent the tit-trees, or *Myrica*, when in blossom. Subsequent careful inquiry proved that Mr. Grainger had been either mistaken or else misinformed. Most probably the latter, for, speaking from personal experience, I can certify that there are one or two old residents of Kangaroo Island who would travel a long distance around the island to avoid coming near the truth. The only, however, did bring out the fact that there are some on Kangaroo Island, which I ascertained is living in the old "Yucca" and is called "carnies" of about a dozen in number, and some survivors and others had been brought in the stems inhabited with these bees, and kept them near their tents for some time. These bees were described as being very large and very handsome, and as making a kind of a comb and gathering honey, which, however, was not very rare.

These reports made me very anxious to secure a "colony" of Yucca bees, and upon a journey from Queenstown to Cape Borda last March twelve months I examined many hundreds of Yucca stems in the hope of getting one. As it happened I saw a number, but not knowing the "signs" I was completely in the dark, and passed them over.

It may be necessary here to describe the "Yucca," which is otherwise called the grass-tree, or by botanists *Xanthorrhoea* Tater. It obtained the specific name "Tater" from having been first seen by Professor Tate, one of the party who went to Kangaroo Island under the name of Xanthorrhoea. Mr. J. G. O. Lepper, visiting the island afterwards, noticed that it differed considerably from the form of grass-tree upon the mainland known as *X. quadrangula*, and obtained specimens of the flowers, leaves, &c., which he forwarded to Baron von Mueller, who recognized it as a new species, and gave it the name of *X. Tater*.

This plant, which is one of the order Liliaceæ, grows very abundantly upon the island, and often is of considerable size. One recorded by the Conservator of Forests and Professor Tate was 19 feet from the ground to the "grass," and 31 feet from the soil to the top of the flower spike, actual measurement. The highest that I have measured was only 12 feet from the ground to the leaves, and about 2 feet diameter at a foot from the soil. During travel I saw several which were estimated at 15 feet, but we could not afford time to stop and measure them. There is a very peculiar feature about these plants, which has been noticed by Mr. Lepper. They seem to commence life as exogens and to change to endogens later on. We brought up several club-shaped cores of the earlier growth for the purpose of working the problem out. The part appears to start first by producing a cone of extremely hard wood, harder than mahogany, and often a foot in length. Upon this base it builds up a fibrous mass, to a height of perhaps 3 feet, and enveloping this is a shell of persistent leaf-bases, glued together with the characteristic Yucca resin. The stem thus formed is the "blackboy" of the settlers, upon the apex of which the long brittle leaves grow, and from the middle of which springs the long flowering stem. Very rarely there are two stems. These grass-trees resemble the *Dracæna australis* or some of the other tropical Yuccas, and from this resemblance they obtain the name "Yucca." They seldom go into flower until after a fire has passed over them, when every grass-tree that has been scorched—and not destroyed—sends up its flower-stem. It happens often that a track or perhaps a stream will check the fire in one direction; and here will be noticed thousands of long flower-stems upon the one hand, whilst upon the other not one of the grass-trees will have a sign of flower. They must be in some cases very old—perhaps 200 years or more. When they die the interior turns to dust and loose fibre, whilst the outer shell stands. Upon scratching out this dust a large tubelike hollow is made, with the aggregated leaf-bases forming the walls, and at the bottom, in the centre of a thin saucer-shaped shell, perhaps 20 inches across, stands the cone referred to—a long cone pointing to the middle, and rising upon a very short stem about 3 or 4 inches through the centre of the bottom. The roots proceed from the bottom of this bottom shell, separated by a space of about half an inch in large specimens, are as thick as a lead pencil, and descend perpendicularly. Between the old leaf-bases near the bottom of the trunk, up to 18 inches high, the resin is in solid masses, and as much as four bushels of resin have been taken

from three stumps. Higher up it is not so abundant, and it is in this particular that the resin collectors have lost the best part of their harvest by taking only the top part of the trunks, stripping off the leaf-bases, and sifting out the resin.

The Yucca bees build their nests or bore their tunnels in the old dry stems of the flowers, very seldom, if ever, in those that are green or growing. It is simply a hole with a tunnel, proceeding generally in an upward direction, and sometimes there are two tunnels side by side. The one hole serves for entrance and for exit, and sometimes two bees will select the same stem, but bore separate entrances and separate tunnels. They appear to gather pollen, and mix it with nectar, placing it at the end of the tunnel, deposit an egg, then more pollen and honey mixture, and another egg, until perhaps a dozen eggs have been deposited. In time the young bees emerge, all at once, and, as far as I can learn, they occupy the stem as a home for some time. During November, the bees appear to be commencing their nests, for I could never find more than one bee in each hole, and only once or twice was a very little pollen present. In my first researches for the bees I always examined the butts or trunks of the "Yuccas" for the entrance to the hive, and it was not until the children of Mr. H. Harpur, at Karratta Station, brought me the flower stems that I found out my mistake. The first stem brought contained one bee, which rather startled me by flying out with a roar in my face. I then closed the aperture, and opened small peepholes along the course of the tunnel, but found no other bees. The next contained two entrances, with two separate tunnels, and one bee in each. After that I got several more, but with the same result in each case. The bee is eleven-sixteenths of an inch long, and slightly over a quarter of an inch across the abdomen—some are slightly larger. The whole body is metallic blue, with a bronzy tinge over it. The four wings are black, rather narrow, and slightly longer than the abdomen. The legs are short and hairy, and the two hinder ones are provided with pollen-baskets. The head is very broad, and the face is hairy. Finally, the insect is provided with a formidable sting and a very strong pair of mandibles.

Trooper Withall, at Queenscliff, had been interesting himself in securing a specimen of this bee for transmission to the Chamber of Manufactures, but upon my information that all business in relation to the Ligurian importations had been handed over to the Beekeepers' Association, he gave me the one specimen which he had caught.

Whilst at Karratta Station I carefully attended upon three large sweetbriar rose-bushes standing in a neglected garden, and on the first occasion my heart seemed almost to stand still, for there upon the flowers were what at first I took to be several common black bees. They were too quick for me, however, and got away, but not before I was satisfied that they were *not* social bees. I saw the same kind of insects again and again afterwards, but they were always either out of reach or else too quick for me. It is hardly possible to use a hand-net, because the thorns catch the net, and you do not catch the insect. I captured two of the Yucca bees upon the briar flowers, and saw dozens of others sipping nectar and gathering pollen.

There is another solitary bee upon the island very abundant, gathering pollen most industriously and sipping nectar. It is armed with a short feeble-looking sting, and is provided with pollen baskets. It has a black head and shoulders—or thorax—a nut-brown abdomen with a black termination, and four narrow transparent brown-tinged wings, very slightly longer than the abdomen. I could neither find the nests of these bees, nor could I learn where they build, or anything about their habits. Though very alert when upon the top of a flower it was easy enough to pick them up with a pair of tweezers when once they commenced to work, and I caught as many as I wanted for the Museum Collector.

The only other bees met with were the black ones before-mentioned and three other species, all of which are known by Mr. Tepper as solitary bees and as wood-borers.

A short discussion ensued, and several questions were answered.

The meeting then adjourned.

Victorian Beekeepers' Club.

THE thirteenth ordinary meeting was held at the Public Service Association Rooms, on 30th November, at 8 p.m. Fourteen members present; Mr. Ellery in the chair.

The Chairman reported that he had heard from Mr. Naveau of the survival of several of the Cyprian queens that gentleman had received from Mr. Benton. At first Mr. Naveau believed the queens had been lost in introduction, as queens cells were seen on the combs some days after the queens were placed in the hives, but he subsequently found the cells destroyed, and, on further examination, the queens all safe.

The Chairman also reported that a batch of Carniolan, Cyprian, and Italian queens sent out to him by Neighbour, of London, arrived, but all dead except one Carniolan and one Italian.

Mr. Johnson (Kyneton,) gave some particulars of his treatment of foul brood with corrosive sublimate in the manner described in a former number of this journal. Two of his hives were so bad that he had to destroy them. The rest he treated with solution of corrosive sublimate, 1 in 15,000, opened all concave or perforated caps, and syringed the combs with the solution. So far this treatment appeared to have stopped the disease, and all the putrid contents of the cells had dried up. The meeting adjourned at ten o'clock after the usual conversazione.

The fourteenth ordinary meeting was held in the rooms of the Public Service Association, on Monday, 24th January; Mr. Ellery in the chair.

The Chairman introduced Mr. C. Fullwood, of Brisbane, who had lately come to reside in Victoria. A discussion on extracting, queen introduction, &c., took place.

The Chairman laid on the table specimens of flowers of the Rocky Mountain Bee Plant, *Cleome Integrifolia*. He stated he had raised it from seed, and although it had been in blossom some time, it was only within the last ten days he saw bees visit it, since which they were constantly gathering from it in large numbers. He further stated that the plant flowered freely, and continued in flower a considerable time; it stood the hottest and driest weather without drooping in the least, and pronounced it to be a good bee plant for this climate. It was decided to call a special general meeting of the Club for Monday, 7th February, at 8 p.m., to receive a report of the financial and general state of the Club, and to take into consideration the question of continuance of the *Beekeepers' Journal*.

A specimen of comb foundation manufactured by Mr. Fiebig, of Pine street, East Adelaide, was exhibited. It was found to be readily taken to by the bees, and appeared to be made of very good wax. The Chairman stated he had received a very beautiful queen of Mr. Fiebig's breeding. It was of a strain bred from choice Parramatta queens (which produce the most beautifully-marked Italians,) and from stock imported direct from Italy. He promised to report on the progeny of this queen at a future meeting. The meeting adjourned at ten o'clock.

ORIGINAL CONTRIBUTIONS.

Honey Extractors.

If the weather is suitable a good flow of honey may be expected for the next few months, and as the hives are crowded with bees it is wise for the beekeeper to be prepared beforehand for taking surplus honey in the best manner,

and to give them more room. The most useful implement for a beekeeper is the Extractor. They are of different patterns and sizes, one, two, and four frames; they also differ in price. Our extractors are of the newest pattern and they are the strongest in the market. We make them for two and four frames, and to any size. Those for one frame are of little or no use. The extractor for four frames is by far the best. Its wheel-work is very strong; the basin or tin rests on a strong wooden stand, and can hold from eighty to one hundred pounds of honey below the basket, so that nearly a hundred pounds can be extracted without having to empty the tin. This is of advantage. For a keeper of five or more hives an extractor is needed, and it pays well, as much trouble is saved and the bees repay it with interest.

Honey should be extracted as soon as it is gathered and sealed, before it becomes thick and candied. As long as the honey season lasts, these emptied combs can be replaced in the hives to be filled over and over again. Honey-extracting is very simple, and a boy of twelve years can do it; the removal of the full frames from the hives is simple enough, too. With my hives the door and glass division are removed, a few puffs of smoke blown at the bees, then one frame after another is removed and placed on the frame-holder, and if three, four, or five frames with honey and little or no brood have been taken out, there is some empty space in the hive, which serves well in clearing the bees off the full comb. One frame with its top forward, one end of it resting on the bottom, the other at the side of the hive, is put into the hive, the top bar nearly touching the comb inside, with the left hand the outstanding part of the frame is supported, while with the right hand I give the drumming of a gentle march will induce the most of the bees to run off the comb and into the hive with great buzzing. A good shake of the frame into the hive makes the most bees drop off and the few remaining may be brushed off. It saves time and a great deal of trouble to replace empty combs where full ones have been taken as soon as they are cleared of bees, and when emptied they will do for another hive. It is therefore wise to have all frames of exactly the same size. In these hives the honey is always near the back, while the brood is near the entrance. It is therefore only required to take these frames near the door out, and frames filled half with brood and half with honey should remain until the brood is hatched, and then filled with honey.

In the Langstroth hive, the bees store their honey at one side or at both, and also at the farthest end of the middle frames from the entrance. In consequence of this it is more

difficult to find the full combs, as they must all be disturbed to be assured of its contents, and the bees shaken or brushed off into the hive. After two or more frames have been removed and clear of bees, they are taken to a closed room. There, with a sharp knife, the cappings are shaved off, and two or four frames placed in the extractor, top downwards; then the work is set into motion—first slow, but gradually quicker. When most of the honey of the outside cells is extracted, the frames are turned and treated in the same manner, the motion continued longer and quicker at the last to get all honey out, then the frames are turned once more and the rest extracted. In this manner, with care, very young combs can be extracted without breaking, though older combs are better. When the motion is too quick the weight of the honey of the inner side breaks the foundation and forces its way out, or when the comb has no support on the netting around the basket it breaks. Some honey is so tough that it will not extract at all. The uncapping knife should be dipped into lukewarm water, when it will slip between cappings and honey. The weight of the two opposite combs should be as near the same as possible.

As long as only frames full of honey are taken for extracting, and those with brood left undisturbed, the bees will always have a quantity of honey in those frames, which they would require should bad weather suddenly set in. But sometimes, and in good honey seasons, they fill even the front frames with honey, only using a few hundred or thousand of cells for brood. In such case the front frames should be taken out, empty ones placed instead, and these with brood placed near the door to be extracted as soon as the brood is hatched.

The process of taking the honey with an extractor is far superior to the old mode of squeezing it out of the comb. Excepting a few small bits of wax nothing is mixed with it, and that wax ascends to the top in a short time. As our extractors hold nearly a hundred pounds of honey, and if it remains during the night, it will be settled next morning, and ready to be tapped off into suitable vessels at once. Extracted honey is the pure nectar of the flowers; nothing can equal it, and only our little bees are provided by Nature to gather such a delicious article. May consumers be cautious to procure it in its real purity, and they will find that it is a much more tasteful, wholesome, and nevertheless economical diet, than mixtures of glucose, &c. May also every beekeeper make it his duty to offer a real good article! W. ABRAM,

Manager Italian Bee Company, Parramatta,
N.S.W.

6th January, 1887.

CORRESPONDENCE.

IMPROVING OUR BEES.

(To the Editors of the Australian Beekeepers' Journal.)

GENTLEMEN,—There appears to be a wise provision that, under thoroughly natural conditions, the pairing of animals for the propagation of their species takes place in such a way as to avoid what is known as *in-and-in breeding*, and that the degeneracy and deterioration of a race, which inevitably follows too close relationship in propagation, rather comes from artificial causes than from natural ones. As it is with other animal life generally, so it is with the honey bee, and queens fertilised by drones from their own hives deteriorate both in good qualities and hardiness. It is a rule, however, that queens mate far away from their hives, and the chances of meeting with drones from other hives, or even other apiaries are much increased in this way; therefore, Nature provides against *in-and-in breeding* and a consequent degeneration of our races of bees.

In this direction the wise beemaster can do much to improve his breed of bees, in the same manner as stock or flock owners do: namely, getting new blood or new stock of improved kind. There are now many beemasters who devote their energies to importing and rearing queens of improved varieties of bees, for sale. In this way, most of the proved kinds of bees have found their way to Australia, and the well-known Ligurian or Italian bee, as well as the Cyprian, are now fairly established. To improve our stock, then, the obvious plan is to procure queens, or queens and stocks of some varieties of the well-proved Italian or Mediterranean bee. The Italian bees combine the most good qualities, and with them profitable breeding can be effected. Wherever they have been introduced they have improved the then existing race. Black queens mated by Italian drones, brought about an improvement and new energy and hardiness. This should be reason enough to go in for the Italians.

The questions now arise, Is the common black bee capable of improvement? and, Is there a better race, and which is it? To find that out, I shall name the principal good qualities of the honey bee. These are: they breed fast, but not many drones; they swarm, but not so often as to send out small swarms and thus weaken the old hive too much; their greatest desire is to gather honey; they defend their home against enemies; they can be handled by the use of a little smoke without their becoming vicious. As long as a hive of bees has these qualities, it has the most good

qualities combined, no matter what race they belong to. Now, have the black bees these qualities? I am sorry to say that they have not. They breed by far too many drones, which help to consume the store of honey; they swarm by far too often, and the swarms are small; they could gather more honey; and they use their sting upon their master very freely. The Italians breed fast in spring and continue until plenty of honey can be gathered, when they fill almost every cell with honey. They are not inclined to drone breeding and swarming; they defend their homes against enemies; their greatest desire is honey gathering; they have a sting, which they use frequently, but not so often as the black bees. According to this statement, which our best beekeepers confirm, it is a fact that the black bees have not the good qualities; it is also shown that the Italian bees have the most good qualities combined. A judgment on this question can now easily be formed. Is the common black bee capable of improvement? I unhesitatingly say, "yes." Is there a better race, and which is it? I answer, "There is a better race, and this race is the Italian bee, also called the Ligurian." No other race has made such a progress as this, in the short time of its introduction to the different countries. Amongst the breeders of those bees, my success is now well known, and my bees compare favourably with any of that race.

The pure impregnated queen, of a new race, produces pure bees, drones and queens, as long as she lives, which is generally about three years. Her drones may impregnate queens reared of their own race, and thus continue to keep their race pure; or if they mate with a queen of another race, they improve the quality of her progeny. That such hives are far superior in honey production to those of the black ones is acknowledged in every country. Honey production is the principal point most beekeepers aim at; they should not lose the opportunity of improving their stock.

The Italian bees are further of great value for those who wish to keep a hive or two for their amusement, for experiments and science. Their gentleness and beauty justify this. The purest stocks can often be handled without smoke, though a little smoke is advisable and does no harm. Their beautiful colour assists in scientific experiments. Without these bees the great experts would not have succeeded so well in their investigations and demonstrations as they have.

With great care and energy I work to improve my bees, not only in regard to their beauty, but also to their utility. Drones as well as queens are always selected from stocks most suitable for the intended purpose, while

the increase of inferior ones is prevented. The result of such breeding is that a standard race can be produced, which is beautiful and profitable. That the act of impregnation of the queen cannot be guided absolutely by the beekeeper, makes the standard and pure breeding more difficult to maintain; nevertheless, a great deal can be done by the experienced breeder. In consideration of this, it may be possible, by constantly selecting the most excellent stocks for increase, to rear a standard race, which may surpass all the existing races.

W. ABRAHAM.

Manager Italian Bee Company, Parramatta,
N.S.W.,

12th January, 1887.

NEW BOOKS, REVIEWS AND EXTRACTS FROM FOREIGN JOURNALS.

PRACTICAL HINTS ON PREPARING BEESWAX FOR MARKET.

This article is produced in nearly all parts of the world, but it is a curious fact that only the English, both at home and abroad, spoil or depreciate the value of their wax in the manufacture, and yet the article made by them commands the best price. This statement may appear contradictory; but the fact is, if they prepared their wax properly, they would get much more for it than they do; and this result can be obtained with a little more trouble but without extra expense. Beeswax should be clear—high golden yellow—to command the top price, as any shade one way or the other means a lower value. These remarks are not to be confounded with the technical idioms of presidents of beekeepers' associations and other folk, who do not know glucose flavoured with oil, from honey, or a mixture of earth, wax, and paraffin scented with oil of citronella, and marked "pure beeswax" nicely moulded into clear square bricks, from the genuine, although it may be a dirty looking article. The great secret in making nice looking wax is the "melting" of it; in as few words as possible, direct fire heat must not touch the wax, but what is known as a water bath only used. This, with farmers and others, could be managed by suggesting to them as a good substitute a large earthen pan with a glazed earthenware pan to fit into it, with the water under it, and when properly melted, and—which latter detail they know all about better than any one can tell them—after it has been taken off the fire some minutes, to put one drop of sulphuric acid or oil of vitriol into, say each batch, giving a good stir sub-

sequently, then, if it is intended to "mould it" in the vessel used for melting, let it stand, or, if the moulds to be used are basins or deep dishes, let it be carefully ladled into them and there stand until cold. The result will be a bright yellow wax, such as they have never seen before. The buyer will get a wax which his wholesale man will run after eagerly and pay a good price for, and all for the simple details noted above. The Australian and New Zealand settlers send home a good deal of good wax, but the colours are invariably a dirty white or a brownish yellow (both undesirable colours,) which means that it has been spoilt in the melting, and seldom the bright yellow, "so much admired." If they wish, therefore, to excel in this industry they have only to adopt a water bath to melt it and sulphuric acid to clear and throw down any particles of dross that may be suspended in the hot wax, and we shall have Britons all the world over take the lead in one of their earliest manufactures as they have in nearly all their later industries.—*Queenslander*, 11th Dec., 1886.

THE APIARY.

By Apiarium.

It has often occurred to me that one reason why the modern system of beekeeping is unlikely to become rapidly universal, is that, at first sight, it seems as if the expense of such adjuncts, as the honey extractor, &c., is disproportionate to the advantages to be gained therefrom. That this idea is erroneous I do not for one moment doubt, but still I feel it would be an advantage if some method of working with frame hives could be devised which would dispense with the necessity of extractors and other utensils. It goes without saying that such a plan would never be very remunerative, and that as the proportion of extracted honey is always in excess of comb honey, so by doing away with extracting, one of the principal sources of profit would be done away with. However, I believe that when once beekeepers have replaced their gin-case hives with bar or frame hives, the other things would soon follow as a natural course, because it would be seen that the system would soon pay for the extra machinery required. I therefore propose to try and show that even with merely the bare hives the modern system would be a distinct advantage. I can quite see that I have set myself no easy task, but I will endeavour to make the matter perfectly clear. And first let me endeavour to clear away some of the usual objections that are raised by those who are unacquainted with the use of frames to the adoption of the new style of hives. The expense, it is said, is much greater than can

be regained by the use of them. The old boxes or gin-cases cost little or nothing, and require no time or labour to get ready for use. I grant that, but I would desire those who argue in this way to remember that frame hives, when once ready, are always ready; that with ordinary care they should last for many years. Well then, put against the time that framed hives take in preparation, the yearly labour of getting boxes ready, and further the tedious and decidedly unpleasant task of drumming the bees out, or *horribile dictu* smothering them, the labour of cutting out the combs, straining the honey, rendering the wax, &c.—put, I say, these several operations on the other side and I am not so sure that the box system will be found the quickest. I find that it is not generally understood by those who are unacquainted with our system, that everything is available year after year, that even the combs are capable of being used time after time. One of the commonest observations made to me by visitors, is—"What a long time it must take you to make all these things." Yes, but I answer, they are to last me for a long time, for many years, I hope. The same answer would apply to the objection, that it takes up too much time. I do not find it so. It certainly affords me a most delightful recreation, but all the work of preparation is done during the winter on wet days, when nothing else can be done. Having I trust satisfactorily disposed of these objections, I now proceed to show that the frame hives can be advantageously adopted, even where it is not intended to procure extracting and other machinery. I will for the sake of clearness divide my reasons under four heads.

1. Knowledge of bees.
2. Diseases of bees.
3. Regulation of swarming.
4. Feeding, building up of weak colonies.

1. Knowledge of bees.—No one will deny that it must be an advantage to us to know as much as we possibly can about the habits and relations of bees. The same rule holds good in this case as in all others where we have to do with living creatures. If we desire to succeed with them, we must know something about their organisation and manner of life. Now, I would ask my readers what did we really know about bees until the discovery of bar frames and the resulting increased means of observation. Take up any of the works on bees published prior to that discovery, and it is perfectly ludicrous how little they positively knew about their habits. The beekeepers of olden times seem to have stumbled upon some correct facts, but as a rule their suppositions, for they were nothing more, were altogether absurd and incorrect, as, for instance, the old idea that a swarm of bees could be raised by the decomposition of

flesh, an idea I find in an old bee-book I have by me. I maintain, therefore, that it is to the invention of the movable comb system that we owe the large amount of information we now possess as to the habits, &c., of bees. I do not pretend that our knowledge is complete, but it is, nevertheless, very satisfactory. With the frame hives we are able at all times to follow the various process of honey storing and to correct or assist any deficiencies on the part of the bees.

2. Diseases of bees.—Who, that has any acquaintance with ordinary beekeeping, but is well aware of the fact that sometimes the whole of an apiary will be swept away by some disease, and that the beekeeper is helpless to remedy such a state of affairs. One of the first questions I naturally put to people, when, as I often do, I am visiting distant parts, is "Well how are your bees getting on?" and it would be surprising to many persons to learn, how common it is to find cases of dwindling or some unknown disease which has carried off all the bees. By the use of the modern system, any disorder can be at once detected, and in most cases immediately rectified. It is quite true that there are some forms of disease, such as foul brood, which seem to defy all attempts to overcome them, but it may be confidently hoped that in a short time, taking into consideration the numberless experiments now being made to discover a cure, we shall be able to explain not merely the cause but the remedy for this fearful pest. At any rate, it is quite certain that as long as the use of boxes continues so long will such diseases be found. I believe that in a great number of cases foul brood spreads from box hives to frame hives of neighbours, and I am inclined to think, considering how infectious the disease is, that it will not be until box hives are the exception and not the rule that it will be overcome; for as long as it exists in a box hive it is practically impossible to check it. I know that plans have been suggested for treating the disease in boxes, but I believe they have only been attended with partial success.

3 Regulation of swarming.—This result of the modern system should alone be sufficient to recommend it to the attention of beekeepers. Every one appreciates the extreme inconvenience of ordinary swarming. Generally at the most inconvenient or busy time, very often on Sunday, there is nothing to be done but either run the risk of losing the swarms or else neglect other things in order to attend to them. And then the work of living a swarm is often attended with considerable difficulty and labour. Now all this is completely dispensed with if ordinary care be paid to the modern plan of swarming artificially. Not only can more or less swarms be obtained as may be

desired, but the whole thing can be done in a few seconds. I will undertake to make half-a-dozen swarms in ten or twelve minutes without trouble, dirt, or killing a bee.

4. Feeding, &c., weak colonies.—It is impossible to form an idea how many colonies are lost every season owing to the beekeeper not being aware of the condition of the hives. A prolonged winter or early autumn may reduce the stores of the bees so that, unless a little timely succour be given to them, they will perish. If it is true that "a bird in hand is worth two in the bush," it is equally true of bees in the spring. One strong swarm in the beginning of the season is worth half-a-dozen weak ones, and the difference may be altogether due to judicious feeding of a pound or two of syrup. Again, in the modern system the weak hives may be united to form one strong one. All this shows beyond doubt that the modern system has many decided advantages quite apart from the extra yield of honey that may be obtained.—*Tasmanian*, 29th Jan., 1887.

THE BEE-LOUSE.

THE following is the substance of some observations made by Mr H. Tryon in reference to an interesting exhibit shown by him at the meeting of the Royal Society of Queensland on Friday, 7th January.

Whilst requesting information as to the best method of mounting for the microscope a particular bee-parasite, our well-known apiculturist, Mr. R. J. Cribb, introduced to my notice the interesting objects of this class which had suggested his inquiry. Accompanying a specimen of what appeared to be a hybrid Italian worker-bee were three tiny insects, stated to have been found parasitic upon it. These, on examination, proved to be nothing other than the remarkable *Brachia caeca* of Nitzsch. *Brachia* is indeed a noteworthy animal, one of the least developed of the great family of flies proper, or Diptera, and a connecting link as it were between insects and Arachnids (scorpions, spiders, mites, &c.) Its life-history and structure, however, show that degraded though it is, and though it is one in which no wings proper occur, it is nevertheless a true dipterous insect. It is also quite blind, and hence the designation *caeca*. Scarcely exceeding half-a-line in length, it is of a dark brown colour, and is clothed with stiff hairs. Its large broad head is remarkable not only on account of the absence of eyes, but for the possession of various three-jointed antennae contained in deep pits. Considered with reference to those of other insects, its mouth organs too have a

somewhat anomalous form. Its mid-body is short, ring-shaped, and almost merged into an ovoid five-jointed hind body. The six legs are all stout, with the usual number of articulations, and these latter are succeeded by six-jointed tassi, the terminal joint being very broad. In place of claws or pulvilli, as in other Diptera, these enlarged joints end in a comb-like fringe of many teeth. These combs, as also the curved spines of the mouth organs and of the spiracles, or breathing pores, of the mid-body, enable this parasite to cling pertinaciously to the hairy body of the bee which supports it, and on whose juices it subsists, it being a true body-parasite. The survival of the progeny of *Braula* is secured by a remarkable habit, shared by it in common with a few other insects—that of producing its single offspring far advanced towards maturity. The metamorphoses of the young parasite are undergone within its mother, which gives birth to not an egg, not a larva as the product of an egg, but to what in other insects is named a chrysalis, and amongst Diptera a pupa. This pupa is fastened to the hairs of the bee, and quickly “hatches” amongst them. Sometimes only a single *Braula* is found on a bee, but oftentimes as many as eight.

The history of the parasite is somewhat interesting. For a long time since its first notice by Nitzsch in 1818, it has been reported as being restricted to Italian bees, but of late years it has established itself both in Germany and in England. Packard, who has especially investigated the insect diseases of the honey-bee, writing in 1883, stated that it had not been detected (as an insect which had established itself) in the United States, and Mr. A. L. Root wrote in 1877 that he had never seen it there except “on bees just imported from Italy.” Many have stated that *Braula* restricts its attention to the Italian queen-bee, but although this assertion is incorrect there can be no doubt that the introduction of Italian bees is accountable for the occurrence of this pest far from its original home, and that when it is once acclimated anywhere it has no particular predilection for this variety of domesticated honey-bee. As to the significance of the occurrence of *Braula* amongst bees, Mr. J. Fedarb, an English authority, writing from close personal experience, has remarked that “where *Braula* does exist its effects are but too apparent, for the restless and excited state of the colony is such as to interfere with the industrial habits of the insects, and so to lessen the quantity of honey produced as to render the entire stock unprofitable.”

Of the diseases to which bees are subject, no doubt this one is the worst of its class, and comparable in this respect to the one of fungoid

origin—*faux couvain*, or what perhaps is better known as “foul brood.” From my not having known of the existence of *Braula* amongst Queensland bees previously, either by observation or report, no doubt it is not generally met with here; and Mr. R. J. Cribb, without troubling himself as to how it got amongst his bees, will thus perhaps be able to define the limits of its occurrence, and so keep the pest within bounds. Further, in the interests of apiarists he might even do more than this, and rid his apiary of it. He might adopt the plan recommended in the “A B C of Bee Culture” for the extirpation of “foul brood”—namely, the destruction of both affected bees and hives by fire or burying, and the exercise of the utmost diligence in guarding against the parasites being transmitted to other localities, by selling either bees or queens. Bee mites, much smaller “insects,” such as are occasionally met with on domesticated bees in Queensland, are not to be confounded with *Braula*, compared with which they are harmless insects.—*Queenslander*.

THE ITALIAN APIARY, QUEENSLAND.

ABOUT a mile or two from that well-known small patch of cleared land on the main road to the Logan, pretentiously denominated the Eight-mile Plains, is the apiary of Messrs. A. B. Edman and Co., and which they have named the Italian Apiary, Eight-mile Plains. It is situated in the midst of the dense bush such as grows on the light soils to the south of Brisbane. But this light-land vegetation is the very locality to choose for beekeeping on a large scale, for upon it there grows a far greater variety of flowering shrubs and trees than upon rich black or chocolate soil. On these light soils there really seems to be no time of the year at which there is no honey to be got; although the bees may not be able to store any surplus, still they can collect enough to keep the colony healthy; and it was for this reason that Mr. Edman chose the secluded spot he is settled upon for the purpose of forming an apiary. Whether beekeeping upon a somewhat extensive scale can be made successful when the apiary is situated upon true Downs country, or upon the extensive inland plains of this colony, I have not yet heard. A few hives can be kept anywhere, but I am doubtful if 100 and over could find sustenance in a purely grassy country. On farming lands such as the Darling Downs much honey can sometimes be gathered, for lucerne is a good honey plant and so is that weed *stachys arvensis* now so common on cultivated fields, and which the farmers assert causes staggers in their horses. Again, many of the indigenous herbs, such as

appeared in so great profusion this past spring, are visited by the bees. But notwithstanding all this the beekeeper should be located within three miles of forest timber; he then has an almost inexhaustible mine of honey to work upon, particularly if the belt of forest is upon sandy poor-soil land. The timber that grows upon rich lands is very often confined to one variety; thus we see the whole forest all ironbark, or box, or red and blue gum, &c.; but in sandy lands these are all mixed up, so that there is always some tree or other in flower. The quantity of bee food in one large eucalypt is very great; it is indeed almost equal to an acre of flowers on the ground. Thus it is that we see shrewd beekeepers, like Messrs. Spry Brothers and Mr. Edman, choosing the densely timbered lands to the south of Brisbane for the situation of their apiaries.

Messrs. A. B. Edman and Co. now possess about 120 colonies of bees. It is barely over two years since they entered upon the occupation by purchasing a few colonies. For the first year they worked for increase of stock, and were very successful, but were thrown back considerably by that destructive hail, rain, and wind-storm that burst over that district in December, 1885. Their hives, many of them but light small ones, with nucleus colonies, were all placed on the natural surface of the ground; the hail knocked them over, and the storm-waters swept them off the bottom boards, and rolled them over and over. But for this accident the number of colonies would have been by now much greater. To guard against a repetition of such a catastrophe, each hive is now placed upon four stakes driven firmly into the ground, the tops being levelled with the spirit-level, so that all frames will hang true; the hive is thus about six inches above the natural surface, and a bed of concrete surrounds it on all sides to the extent of six inches in width; this prevents any weeds or grass growing close to the hive, and keeps all clear and clean, so as not to harbor spiders, lizards, and other bee-eating vermin. Mr. Edman practises the plan of clipping the wing of all his queens, and when this is done it is absolutely necessary that all the ground about the hives is kept bare of vegetation, or when the queen issues with the swarm she may be lost, or unwittingly trodden upon. It is almost needless for me to say that the apiary is worked upon the modern lines; the hives are all of the Langstroth pattern, and hold ten frames each. At the right time a top story is put on, and from this only is the honey extracted. This top story is the same size as the lower one; ten frames are put in it, and each of these frames when full will contain 3lbs. of honey. The apiary is chiefly run for extracted

honey, and the bottles of clear, clean honey from this apiary are well known in the Brisbane shops. It is one of the essentials of the business of beekeeping upon modern lines that the bee-master be somewhat of a carpenter, and the more he is master of the joiner's art, the better he will succeed, other things being equal. Mr. Edman is a joiner by trade, consequently his hives are true to a hair's breadth each one with the other; there is a store of about 100 piled up in the verandah, all ready for future use, and it was a treat to look at them, so close were the joints and so accurate the fit one upon the other. The necessity for this accuracy is twofold: in the first place when there is not a joint or a crack but what is close, the wax moth cannot find any entrance except at the entrance, and the bees will generally guard that; secondly, it is necessary not only that every hive in an apiary be interchangeable one with the other, but every part of every hive, then a comb of brood can be taken from a strong colony and placed in a weak colony and so soon increase the population that it in its turn will be strong, or a comb of honey can be taken and given to stimulate a poverty stricken hive, or to put into a hive to induce a new swarm to stop; and in innumerable ways is this interchangeableness a help. It also saves many stings to the operator when a frame, a super, a top, or a bottom each fits without jar or trouble. I noticed in Mr. Edman's workshop a hand-turned circular saw bench which could not have cost less than £20; its help to the hive maker must be very great, for by its aid extreme accuracy of lengths is certain and the rabbets are cut out to a hair's breadth. The extractor, the tanks, the smoker, the foundation-making machine, and all the paraphernalia of the modern beekeeper are of course to be seen in the work-room. Tinning the honey is not entered into; it is all put up in bottles holding about 2lbs. Many bottles are there ready filled for sale and large piles of empties are stored outside. In common with other beekeepers, Mr. Edman now finds the sale for honey very slack; the local wants of the town are completely supplied, and an export trade has not yet sprung into existence. At the price obtainable for honey two or three years ago—that is, 8d and 9d. per lb.—beekeeping was a profitable occupation, but it is with honey as with all other produce of the land—there is a superabundant supply, and unless a large export trade ensues it is doubtful if beekeeping will pay for the trouble and constant attention it involves unless the apiarist can make extra returns by selling colonies, foundation, and appliances.

Mr. Edman uses a solar wax melter somewhat similar to that described in a late issue

of the *Queenslander*, and it does its work admirably. The principle is this:—A tin box (trough-shaped) has a false bottom laid in it, and on this are placed the wax cappings and combs desired to be melted; over this is laid a pane of glass supported by rabbits on the inside of the box; a space of half an inch is allowed, and then another pane of glass is laid. It is essential that these glass panes fit accurately to the box so as to prevent the escape of the heated air below. All being ready, the box with the wax in it and the panes of glass fixed, is placed out in the full sunshine; then a reflector, the same size as the panes, is fixed at right angles with the glass so as to reflect the sun's rays upon it; this reflector can be made of bright tin, and Mr. Edman's was so made, but he intends substituting looking-glass. Upon placing my hands on the surface of the glass it felt pleasantly warm, but apparently not near the heat required to melt wax; but, lifting off the glass, Mr. Edman desired me to put the tip of my finger on the wax. Thomas-like I did, but quickly withdrew it, for the temperature was

absolutely scalding. It seems incredible that so much heat can be got without the application of fire, but it is so, nevertheless, and it led me to think that the attempts of French scientists to utilise the great solar heat in their Algerian colony for domestic and cooking purposes will yet be successful. For melting wax Mr. Edman says the apparatus is simply perfect; it is no trouble, and the quality of the wax is never injured, for there can be no burning or discolouration. It is almost needless for me to say that the whole of Mr. Edman's bees are more or less Italianised, for the superiority of the strain over the ordinary black bee is almost undisputed by those who have kept the two species side by side in this colony. The potency of the breed is shown in the fact that the majority of the bees wild in the bush within thirty miles of Brisbane now show traces, more or less, of Italian blood, yet it is only six years since the breed was introduced by Mr. C. Fullwood, of North Quay, Brisbane.—The *Queenslander*, 22nd January, 1887.



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JOURNAL

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J. H. KITCHEN.



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THE

Australian Beekeepers' JOURNAL.

VOL. II. No. 1.

JUNE 10, 1887.

Price 6d.

Editorial.

"THE AUSTRALIAN BEEKEEPERS' JOURNAL" now enters upon its second volume, and second year of existence. We pointed out in the last number—issued in March last—that owing to our subscription list not having come up to our expectation, we were undecided as to continuing its publication. But we have received such numerous enquiries about it, and urgent requests for its continuance, as well as a very substantial addition to our subscribers' list, that we have at last determined to resume its publication, trusting to our readers and all Australian beekeepers to enlarge our roll of subscribers. The terms of subscription will remain as last year, but we hope to see the day when its name will be so much increased, as to enable us to resume its cost to even a more modest amount. We propose to follow the format adopted last year, but shall endeavor to enlarge our Enquiry Column; several experienced agriculturists have offered their aid in giving replies to questions from our readers or from any one interested in bee matters. We also propose to devote a column or two to "News and Reports from Colonial Apiaries," as well as to information concerning the market for honey, wax, &c.

There is an increasing interest in the beekeepers' industry throughout Australia, and a rapidly growing desire for knowledge concerning the modern methods of management, and it is a matter for congratulation that this important branch has not been overlooked by the Royal Commission on Vegetable Products—for an enquiry into the subject has been already instituted by that body. These colonies are admirably adapted for the production of honey and wax, and most of those who have systematically followed beekeeping by the modern and improved methods in fairly good localities have done well and added substantially to their

incomes, without much preliminary outlay of money or of labor in management.

To farmers and selectors in the bush beekeeping, properly managed, offers a ready means of supplementing the returns from other sources, without in any way interfering with their special and more important occupation. Land, covered with bush, and especially enriched with various kinds of trees, wattles, and even thistles, is almost inexhaustible in its production of honey at the right seasons, while clover, lucerne, rape or linseed fields furnish a honey harvest most beautiful during the height of the blossoming season, and of a quality that commands the highest price. There is little doubt therefore that beekeeping will be as much cultivated as a business for profit in those colonies as it is in the old world and in America.

The chief object of our journal will be, as it has hitherto been, to encourage the industry of beekeeping, and induce farmers, gardeners, graziers, and selectors to take it up, and help to their living and other very interesting and profitable recreation, to meet by giving information, answering questions, and publication of the experiences and views of skilled specialists, by furnishing extracts from foreign bee journals, and, so far as possible, advising in matters of management and to disposal of the produce.

We have been assured that our last year's effort was not barren in this respect, and we venture to hope that we shall not only succeed better in this direction with our new issue, but that a largely increased circulation will soon establish *The Australian Beekeepers' Journal* as a permanent and not a passing work.

HINTS FOR THE SEASON.

The winter months afford beekeepers the proper opportunities for making preparations for the busy season, which commences early

in September in the warmer parts of Australia outside the tropics, and later in the same month, or early in October, for the southern parts of Australia and Tasmania.

Although bees do not become torpid and confined to their hives in Australia, as in colder climates, but fly out for food and water on every fine day, it is nevertheless advisable to disturb them as little as possible during the colder months, and, except for feeding or in case of suspected mischief in the stock, no hives should be opened at all in June, July, or August. If, however, necessity arises for opening, it should be done only at midday on the warmest and calmest days. Where feeding is necessary, preparations should be made in April or May at latest, so that food can be introduced without disturbance or loss of much heat from the cluster; if a good thick mat or two thin ones have been supplied, with a hole in, or with one corner turned up to allow a passage for the bees to the food, the feeder can be introduced and filled from time to time by gently lifting the roof or cover board for a few seconds. Where box hives are used, it is necessary to insert the feeder *under the hive, on the bottom board*, and this can be done by ordinary care without loss of heat or disturbance of the bees.

With frame hives there should be no fear of wet and damp getting in, but where box hives are piled one above the other, or covered with bark, old boards, old bags, &c., as they frequently are, dampness to the extent of rotting often results. This, of course, is most mischievous and should be always avoided. If such things have been used to shelter the boxes from rain or sun, they should be at once looked to and removed, or, if required, they should be laid on battens or strips of board laid across the tops of the boxes, so that air can pass between them and the tops of the hives.

It is always desirable to examine stocks in April or early in May at latest, to see that all are fit for winter and possessing queens—those that are queenless should be united to other stocks possessing queens, and in the case of weak colonies, two or three united together. No stock can be considered a strong one for wintering here, unless it have at least four or five frames well covered with bees.

All frames should be looked over for traces of foul brood, and if any solitary unhatched cells are seen, open them, and if they contain the viscid brown matter, indicative of their disorder, cut them out and mark the hive for careful examination when breeding fairly recommences in the spring.

The chief matters to be looked to during the next two or three months will be:—Cleaning up all hives, floor-boards, supers, roofs and frames that have been in use, ready for next swarming season. This should be carefully done; all old bits of comb or propolis scraped off; the inside should be scrubbed with sand, soap and water, and where there is any suspicion of foul brood

having existed, the inside of all parts of the hive, and especially all crevices, should be washed over with a solution of salicylic acid by means of a clean paint brush. This solution can be made by dissolving 1 oz. salicylic acid and 1 oz common borax in 4 pints of hot water. Some use carbolic acid and water, but we have found this often leaves an odour which appears to be offensive to bees, sometimes causing them to swarm out. The hives should be dried in the sun after scrubbing, before painting with the disinfectant solution. All ordinary painting of hives should be done in winter. The hives should be stowed away in a dry place, and the frames are best kept inside them. If any frames of combs have been saved from last season, which are free from any suspicion of disease, they should be carefully put away in a box or in the empty hives, for they will come in very useful in spring. It will be a good thing to fix on the positions for placing new stocks or swarms in the approaching season and have everything ready for putting the hive in its place. A supply of frames and foundation should also be secured, as beekeepers, who postpone these matters, often find swarms flying out before they are expected and before anything is ready.

Those who use boxes should lay in a stock of *clean new* ones; if old ones are used, we advise that they be well scalded out or *even boiled*; for the most common way in which moth and disease is brought into a box hive apiary is by using old boxes that are not thoroughly clean. A little trouble in this direction will amply repay the beekeeper.

Honey that has been left in the hives till now will be fully ripe and perhaps too thick to extract or get out of the combs easily, and will generally be found of a darker color than that taken earlier. It will be found best to take all surplus honey in April at latest, always bearing in mind that an ample store for the winter is left; the quantity depending on the strength of the stock. Strong hives should have from 15 to 20 lbs. to provide against a long winter in this climate.

Those who like to have bee flowers about their apiary should now sow seeds of *phacelia*, corn flower, borage for early flowering, *linnæa Douglasii*, *cerinthe* (another species of borage), and plant out plants of *echium candicans* and wallflowers, and if there is any spare or waste ground about, sow horehound or catnip, or alsike clover.

QUEEN BEES.

We have had numerous enquiries as to how and where to obtain Queen bees, especially Italian (or Ligurian) Queens, the cost thereof, the best place to get them from, the time to get them, and so on, we now give all the information we can on the subject.

There are now many Beekeepers in Australia who make it a business to rear

Queens for sale, more especially Italian or Italian crossed with black bees known as Hybrids. Last season some pure Cyprian Queens were imported into the colony, and young Queens raised which have been mated with Italian drones.

From our advertising columns, it will be seen that Queens can be obtained from Cyprus. The prices of pure Italian Queens from Adelaide Apiarium last season were from 30s. down to 15s., or generally, say £1. The higher price is demanded for pure Queens early, and the lowest for very late in the season.

From New Zealand last season they were from 20s. to 15s. From the Parramatta apiary which possesses a beautiful strain of Italian Queens, the prices last season varied from 40s. to 20s. Imported Queens from Cyprus or Italy cost from 20s. to 40s. (carriage paid to the colony).

Queens can generally be obtained from October till April, and in the remaining months also if desired, but it is best to get young queens that are reared in the spring and up till January or February. When ordered, they are sent either in a little cage with a few attendant bees by post, by which method they come quite safe if the journey occupies only a few days, or in boxes, with a small frame of honeycomb, which is forwarded as a parcel; by this method they will travel safely for ten or even twenty days, ample food being provided in both cases.

Hybrid Queens can be obtained at much lower prices, down to half a crown each, and Black Queens can often be got for the asking from Beekeepers during the swarming and summer season.

We append a list of names of apiarists that come to us, who supply Italian or Cyprian Queens. Italian mated with black drones and Hybrids can no doubt be obtained from any of them.

In a future number, we will give a few hints on the methods of introducing Queens practised by various experienced apiculturists.

Mr. W. ANNUM, Italian Bee farm Parramatta, N. S. W.; Mr. J. M. LLOYD, Sunnyvale Apiary, Croydon, Vict.; Mr. J. HORSKIN, Matamoras Apiary, Auckland, N. Z.; Mr. A. L. BOWSER, Engineer-in-Chief's office, Adelaide; Mr. A. FERRIS, Pile Plant, N. Adelaide; Mr. H. NAYLOR Hamilton, Vict.; Messrs. WRIGHT and Co., Murrumbidgee, Glenorchy, Tasmania.

DISAPPOINTMENTS IN BEEKEEPING

PEOPLE commencing to keep poultry, pigs, cows, even sheep and cattle, usually have to go through a period of loss, bad luck and disappointment. Very often this is due to either inattention, ignorance, or fineness, but sometimes to bad seasons, or to prevalent diseases which affects equally the beginner and experienced stock-keeper, but which usually does the greater harm to the beginner for lack of knowledge of management. This is equally

and perhaps more frequently the case where the live stock consists of bees. Beginners in apiculture generally meet with disappointment at first, and often give it up as a bad undertaking, after perhaps losing their first hive of bees, sometimes for want of knowledge, and sometimes from disease, often induced by injudicious management.

It is also a lamentable fact that in some localities and some seasons, bad times come upon the most careful and experienced beekeepers; disease or other misfortune falls on the bees, which often not only puts a stop to production of honey and wax, but destroys stock after stock, and decimates the apiary like an epidemic among cattle, sheep or poultry.

It is, however, with what may be regarded as avoidable or preventable disappointments I shall first speak. Take, for instance, a case that occurred to myself over twenty-five years ago. I commenced with two stocks of bees at Williamstown, one in perhaps the first frame hive used in this colony, the other in a Neighbour's Collateral Hive. I started with two early swarms at the end of September, and all went as merry as wedding bells at first; the frames were filled with comb and brood and some honey, but as October passed, honey and pollen began to fail, the queens ceased laying, and the stocks dwindled until it became apparent that the locality was unsuitable to beekeeping, when by feeding freely and continuously breeding recommenced, and the stocks were saved. For a year or two they barely existed, but never gathered enough to keep themselves until garden and other cultivation improved matters a little, but even then frequent feeding was requisite. The fact was, there was no regular forage within three miles, and that was chiefly small patches of titree blossoming in the Spring; there was no Summer or Autumn forage, no eucalyptus nor clover fields, and very little of anything else. Beekeeping could scarcely be profitable in such a locality. Even at the present day beekeeping has been tried over and over again on the open plains between Melbourne and Sunbury with a similar result to that obtained at Williamstown. The absence of flowers (except the quickly fading Spring grass flowers) and of Autumn flowering plants and trees renders beekeeping in such places a hopeless and disappointing occupation.

The same cause, (unfitness of locality from lack of bee forage), is an explanation of the disappointments in beekeeping in numerous instances, especially to beginners in the art.

The locality may be mounted in some cases where bee forage is moderately plentiful, for instance, dusty, smoky or noisy localities are unfavorable, the proximity of factories, especially breweries, cordial manufactories, vinegar works, which are very injurious because the bees attracted by the odour, flock to the vats and open vessels and get drowned in such quantities as to cause stocks to dwindle,

despite the efforts of the most fertile queens to keep up the population.

It is seldom beekeeping can be made profitable in or near town or populous neighbourhoods, although it is quite possible to keep bees strong and healthy in the suburbs of our chief Australian cities, and in some cases indeed surplus honey in small quantities can be obtained provided the locality is free from the chief objections already referred to.

I now come to instances of disappointment from other causes.

Mr. A., living near town, but in a fairly good position for beekeeping, bought a swarm of bees in November, and had them transferred to a frame hive in the same month; they did well, filled up seven frames with comb and a fair amount of honey; the queen was a good one, and the population began to increase rapidly. For some reason or other he moved the hive early in January to a spot about 150 yards away from the position they had been in. He states he soon found the bees in the hive diminishing, and a week afterwards saw large numbers of dead bees strewn the ground near the old position, and in a fortnight more there was not a bee left in the hive, and the combs were nearly all empty. He "did not intend bothering with bees again," for "he had lost over two pounds in money" by the adventure; the cause of Mr. A.'s disappointment must be apparent to every beekeeper. Moving the hive led to the loss of a large part of the stock which probably became so weakened as to fall an easy prey to robber bees, unless as might happen under any circumstances, the queen died and the remaining bees absconded; at all events, the avoidable cause was moving the bees from their once established position.

(To be continued)

TASMANIA.

News has come to us from the south. Foul brood has found its way into some of the best apiaries, and has already destroyed or hopelessly weakened a large number of stocks. Mr. Lloyd Hood informs us that his small apiary has been almost destroyed with this pest, and his best stocks lost. He states he persevered with the phenol cure, as well as with the salicylic acid mode of treatment advocated by Prof. McLean, of the United States Apicultural Station, but without success. Foul brood in his case was evidently accompanied by the disease often noticed in this colony in some cases to precede, in others to exist contemporaneously with foul brood itself, for he mentions heaps of dead bees outside the hives every morning. Mr Hood further informs us, "it is the same tale of disaster all through the South Island with few exceptions." The Marinook Apiary of Mr. Wright's, at Glenorchy, has suffered severely, but whether from bad season or disease is not stated.

From the Ravensdale Apiary, it is reported of the past season: *No swarms! No honey!* It is feared the collapse of the industry this season will act as a serious deterrent to the progress of Bee Keeping in the southern districts of Tasmania.

We see and read with pleasure some very practical and interesting articles in the "*Tasmanian*," under the head of "The Apiary," styled Bee Talk. In Bee Talk, No. 42, one or two forms of section crates are described; in one of them the crate is formed by the half story super, and convenient access is given to the sections by hinging one side of the super. A slatted bottom to this super or crate is also described. It is not clear whether this is like the Heddon slatted bottom or honey board, but unless it be so the usual and almost constant trouble with brace combs from the brood chamber frames to the boxes will occur. If, however, the slats are one inch and five-sixteenths wide, set three-sixteenths apart, and three-sixteenth space exactly over the centre of the frame beneath, a break joint is formed as in the Heddon honey board, and the trouble referred to either does not occur at all, or is reduced to a minimum. Simmins says, however, that the only way to avoid it entirely is to put frames or section boxes crosswise with the brood frames and resting on them. The "Talk" on ventilation and wintering is interesting and instructive, and advocates moderate top ventilation, which many apiarians condemn, but which we are sure is necessary in our colder seasons.

In Bee Talk, No. 44, "Apiarian" discourses on flower fertilization in an article fully worth perusal, and then gives advice to an enquirer who wants to know if "gas tar" would not do to paint hives with, as white paint is expensive. I fancy the enquirer would find "gas tar" by far the most expensive when he found on hot summer days his hives were converted into solar war extractors and honey and comb running out at the entrance. "Apiarian," of course, properly advises white, or, at least, a light color. If beekeepers would try the white or light colored Carson's paint for their hives they would find it last much longer than white lead or zinc paint.

"Apiarian" quotes Simplicity Langstroth hives at £1 15s. each, in cases of ten; if this be so, somebody must do well out of bee-hives for cases of ten delivered in the flat, after importer's profits have been added, cost us last season, in Melbourne, less than 14s. each, and better hives than the Simplicity, are made in Adelaide, pay duty in Melbourne, and still sell for less than 17s. The cost of frame hives has been a great bar to their adoption, and we hope soon to see them offered to beekeepers at reachable prices, but anything over 20s. is, we believe, too much and almost prohibitive.

Proceedings of Beekeepers' Association.

VICTORIAN BEEKEEPERS' ASSOCIATION.

The fourteenth meeting of the Victorian Beekeepers' Club was held at the rooms of the Public Service Association, the Melbourne Athenaeum, on Tuesday evening, the 17th inst., at 8 p.m.; the president, Mr. Ellery, in the chair. The chairman informed the meeting that it had been arranged to continue the publication of the *Australian Beekeepers' Journal*, but not in the manner suggested at the last meeting, as that was considered impracticable until the Club was much stronger. It would, however, be carried on under much the same arrangement as last year. The first number of the new issue would be ready in June, and be published monthly as before. He further stated that the Journal had become known in Europe, and he had received requests from Italy, France, Germany, Switzerland and Belgium, as well as from America, to send the Journal in exchange for journals of various European and American societies, &c., and extracts from the *Australian Journal* had already appeared in some of these.

The desirability of extending the scope of the Club was also mentioned, and the members present were unanimously of opinion that it was desirable to endeavor to establish branches at least at the principal country towns and other places where apiculture was carried on to any extent. Mr. Fullwood considered that the best method of securing and increasing the industry was by means of shows and exhibitions, particularly of agricultural appliances.

Mr. Ford stated that so far as his experience went, it would be a difficult matter to move many country people who kept bees to any improvement of the common method, or rather, so much, of bee-keeping which was in vogue among them. Actually showing them the bees working in frame hives, and the results thereof, might have some influence in improving their unprofitable and careless style, but he thought this would be the only way.

The president said he believed that shows and exhibitions of Bee products and appliances at our agricultural and other exhibitions would actually do what Mr. Ford suggested and much more.

It was proposed by Mr. Fullwood, and seconded and carried, that the name of the Victorian Beekeepers' Club be altered to the *Beekeepers' Association of Victoria*.

It was then agreed that the membership subscription to the Association should be 10s. per annum for city and town members, 2s. 6d. per annum, and further that the annual subscription to the Journal form money

of the Association, town and country, be 5s. per annum, the ordinary subscription being 6s. per annum.

The secretary was instructed to write to the committee of the National Agricultural Society, asking them to make arrangements for apicultural exhibits at their next show.

It was also agreed to print a leaflet for general distribution, setting forth the objects of the Association, the desirability of branch country associations, information respecting the Journal, &c.

The president then brought under notice of the members the results of some experiments lately made in England with certain substances that had been styled "Apifuges"—a not very appropriate name (he thought) to apply to substances which were said to prevent bees from stinging any surface smeared with the substance. It had been found that what was known as *Oil of Winter Green* and *Oil of Myrtle Sweet*, if mixed in very small quantities on the hands of one manipulating bees, prevented them from stinging, and although they might pounce upon the hand fully intending to sting, they appeared checked by the odor or presence of the oil and foam, or thought better of their intentions. He had not tried it himself yet, but intended to do so the first warm day. If it proved to be successful, as was reported, it would be a great acquisition to beekeepers to get to sting.

Mr. Ford pointed out that there was a distinct remark made from the fact that while only a purely ornamental from the root and leaves, the respective plants they had been produced extraneously or built up from their created existence by the bees, they were fitted to the vibrations of many small, and in some degree allied to human, and bee pollen.

In answer to question, the president stated that he believed both the clubs would be situated in Melbourne for about 25 years.

It was arranged that the next meeting should be held on Tuesday evening, the 28th June, after which the meeting terminated.

CO-OPERATION AMONG BEEKEEPERS.

A paper read before the Queensland Beekeepers' Association, by Mr. J. J. J.

"I think if beekeepers get to know a man in Queensland, and I hope it may, the best way to help on that man will be by co-operation, for by that means we shall not only benefit ourselves by getting a better price for our honey, but to a very great extent we shall benefit the public. We should be able to send the best way of placing the honey on the market; we should be in a position to give larger orders for packages, and obtain them at a much lower price than we do at present, and we should save the profit made by the middleman.

"Another advantage would be gained by bringing our honey in bulk from the apiaries,

thereby saving a lot of trouble; and by delivering to the customers we could get an advance on the prices now ruling; and we must not overlook the still greater advantage to the public in that they would be supplied with a guaranteed article at a lower price, in many cases, than they pay now for a very inferior and doubtful article. Again, if shopkeepers can handle honey and make a profit, I cannot see what is to prevent us doing the same. Could we not open a store for the sale of honey, wholesale and retail? We could sell a genuine article to the shopkeepers, and at a price which would give a fair margin of profit to each, and so have command of the market, and drive out much of the rubbish that now goes by the name of honey.

"A week or two ago I saw two samples of this so-called honey. I don't believe that bees ever saw it, and if they did, I am sure they would not be mean enough to gather it. In one case the price of this vile stuff was the same that we now ask for a good grade of honey; in the other case, about one-half more, and I have no doubt the people who bought it for honey do not feel like eating honey again as long as they live. I think one of our chief objects should be to drive this sort of stuff out of the market, and keep it out. To accomplish this desired object, beekeepers must co-operate, then open a shop for the sale of honey, together with fruit or something that will not require much capital; then procure the services of a good honest man, one who is well known in town—a small beekeeper who has not bees enough to occupy all his time, would probably be the best man, for he would necessarily feel an interest in the matter; by these means I think the sale of honey would soon be doubled.

"I cannot tell how it is that grocers and other shopkeepers do not seem to push the sale of honey. You may travel up and down some of our principal streets without seeing honey exposed for sale. That, I am sure, in part accounts for the slow sale of honey in Brisbane. If honey could be put up in a more attractive form, and brought more prominently before the public, I am sure parents would give their children more of it; and if the children had a voice in the matter, they would much prefer good honey to oily butter. I am sure there are thousands of children in Queensland who hardly know the taste of honey, and the sooner they do the better, both for their good and ours. In an article on 'Selling Extracted Honey' Mr. France shows the difference between a man going out to sell honey, and the one who waited to be asked for it; the former sold 1200 lbs. of honey in three weeks, his commission amounting to over £7, and that in the same town where the other man sold only 100 lbs., and grumbled, because, as he said, 'there was no profit in selling honey.' I wonder how many grocers, when they are going their rounds for orders, ask their customers if they can send a bottle of honey. In the greater number of shops

honey is not to be seen; if you want it you must ask for it, and in some cases when it is handed to you, you find in place of a cork a piece of brown paper tied to the neck of the bottle with a very doubtful-looking rag, and the outside of the bottle so thickly fly-endorsed that you wonder what the inside can be like, and you come to the conclusion you don't like honey and so take a tin of golden syrup instead, for it is so well got up it must be good.

"Before we beekeepers can expect success, we shall have to let the public see that we are in earnest and take an interest in our work. We must supply a *good article*, got up in an *attractive* form, and we shall soon be successful competitors."—*The Queenslander*, May 7, 1887.

Original Contributions.

HIVES.

THERE is no more important question to the Beekeeper, whether he be a veteran or a beginner, than that of *What Hives are to be used*. Hives, at the cheapest, are an expensive portion of the necessary plant, and at the dearest, are far beyond the means of those who desire to make a profit of Beekeeping. As the chief object of this Journal is to encourage the industry, and induce people in the country to whom a little addition to their wages or income is a matter of moment, to take it up as means of obtaining that addition, we shall give our readers the best information we can as to the best hives, the cheapest hives, the worst hives and the dearest hives, irrespective of any consideration except that of the advantage of the Beekeeper; we will also advise to the best of our knowledge.

Of course there is comparatively little to be said about box hives and skeps, but as the cost of frame hives in Australia has hitherto been such as to prohibit their general adoption, especially among the class we most desire to help, and Beekeeping in boxes is still carried on far more extensively than in frame hives, a few hints on these kinds may be found useful in a small way.

We rank under box hives all that are not made for moveable combs, and their name is legion if we reckon all the countries where beekeeping is practiced, *hollow logs, clay pipes, old chimney pots, boxes of all forms and shapes, straw hives or skeps*, down to our favorite colonial ones, the *red Dutch gin case, kerosene boxes or candle cases*. These are all cheap, most of them very bad and unprofitable, but on the other hand easily obtainable, and as a rule not objectionable to the bees. Now anything that will keep the bees from rain, wind and cold will do, but they will do better if it will also keep them from too much heat; therefore our favorite red gin case would be generally good as regards size, soundness &c., but is

had no regard to color, for it gets so hot in the hot summer sun as to often cause the comb to often enough to drop down; paint it *white* over the red and this objection ceases, and the gin case becomes a good box hive. Uncolored or unpainted boxes get dark colored in a little time when exposed to the weather and therefore absorb the sun's heat as bad or worse than the red gin case.

To make the best of box-hive beekeeping, have two boxes of one size as far as possible for this reason: when you want to drive the bees from a full into an empty hive, in order to take the honey, it is so easily done if the new hive is exactly the same size as the old one.

Paint all the hives white or nearly white, make the entrances—not the little notches, they naturally are through which the bees can neither ventilate the hive properly, nor get in and out fast enough in busy times—but cut out from the edge of one end or one side of the box a long notch $\frac{1}{2}$ of an inch deep and 8 or 10 inches long, so that it make an entrance the size when it is put on its bottom board. If the swarm is weak, or cold weather comes on before they are strong, you can easily diminish this opening by a little piece of board placed before it.

Don't leave any holes or cracks in the hive under this opening.

Most people put the boxes with the longest side to the front; we think it best to put the shortest side to the front.

Each box should have a board, a strip of bark, some palings, or anything of the kind, put on the top to keep it weather-tight and protect it a little from the sun's rays.

By attending to these two or three points, bees will be found to thrive better and store more honey than those whose no such precautions are taken. Straw hives or skeps are certainly far better than boxes and it is a wonder they are not used here, for they could be made very cheaply.

It has often struck us that some of the advantages of frame hives could be obtained from simple boxes by a very little ingenuity.

If a box is not ready to receive a swarm (say a candle box), and some clean bees wax melted and poured on the bottom of the box in straight lines so as to make several lines of wax parallel with one of the sides or ends, and each line of wax an inch and a half, or an inch and a quarter apart, the bees will commence to build their combs on these lines of wax, and will build them all nearly parallel. Now suppose the *bottom of the box* which is the *top of the hive* to be made loose and removable, when it is full of comb and honey it would be only necessary to pass a long knife around the sides of the hive wherever the comb was attached, and the top with all the comb could be lifted off, and the combs as are full of honey cut out and used with brood put back. This is only one way in which a box hive could be

made to do part of the duty of a frame hive, and ordinary ingenuity would soon suggest other ways. However, as regards the hive question only. Good sound boxes of the same size or all of two sizes only, all painted white with entrances as described, will be a great improvement upon the methods in which box hive apiaries are usually arranged. It may not be generally known that boxes, all of the same size and quite as good, or better than gin or candle cases can be obtained from our Metropolitan timber yards as cheap, and, if in numbers, cheaper than the latter can be bought at the stores.

(To be continued.)

Correspondence.

CYPRIAN BEES.

MR. AUGUST FIEBIG'S VIEWS EXAMINED.

IS the *Australian Beekeepers' Journal* for March, 1886, which through the courtesy of R. L. J. Ellery, Esq., has been placed in my hands, I find a paper upon "The Various Races of Bees and their Peculiarities," observed by an Apiarium." The author is Mr. August Fiebig, a German resident in South Australia, and the paper was read at one of the monthly meetings of the South Australian Beekeepers' Association, then published in the *Adelaide Observer*—a copy of which Mr. A. E. Bonney, of Adelaide, kindly forwarded to me. The great publicity given to this essay by Mr. Fiebig, causes me to ask space for some remarks on the ideas it contains; for, in all my experience with various races of bees, and my reading of most of the apian journals of the world, it has never been my lot to come across, within three pages of printed matter, a greater conglomeration of absurdly incorrect statements about some of the races of bees, nor an essay on this subject which appeared to have been dictated by a greater amount of prejudice, than this one by Mr. Fiebig. In these remarks I shall confine myself the time to Cyprians, yet will profess them by saying that I have seen and handled all the races mentioned by Mr. Fiebig, and with most of them have had some years' experience; also I have visited the native lands of all these races, except the Caucasian, and have had no object, nor have I now, other than to arrive at the plain truth in the matter.

Seven years ago (in March, 1880) I first landed in Cyprus. From childhood, I had in my native land (America), had more or less to do with the common bees, and later with Italians, so that when I found myself, twenty years after my first lessons in bee-management, with 210 colonies of bees under my care in 1880, I can fairly claim, even though I had never previously handled Cyprians, I was not out of my element. Two seasons were passed

in Cyprus, and, though I have since resided in Syria, Greece, and Germany, Cyprus has been revisited many times. "The Cyprus Apiary" has been kept in existence during the whole time, and I have continued the cultivation of Cyprians in Europe. Moreover, from almost every country in the world where modern methods in beekeeping have obtained, I have reports of the Cyprians that have been sent there. Considering the above, every reasonable person will surely be ready to admit that my opinions are deserving of at least as much consideration as Mr. Fiebig's, he having for the greater part obtained his through observations made while keeping bees in Germany, where, unfortunately, there are very few beekeepers who are capable of breeding for any length of time, any race in its purity. I am aware that the high reputation given German beekeepers by many writers, who know more of them from hearsay than in any other way, ill accords with the statement I have made above; but nevertheless, I only state a fact of which travel and residence in Germany during several years, as well as perusal of the leading German bee journals, has convinced me. Proofs enough might be brought forward to sustain what I have stated; but I will cite a single one, so striking that, of itself, without bringing forward a thousand others, it might serve to prove the point. Not long ago I attended one of the great gatherings of German and Austrian beekeepers, known as "*Wanderversamlung*," which is supposed to unite in itself the most advanced and correct ideas of the two Empires, and where Dzierzon, Vogel, Günther, Dittler, and other "great lights" always preside. One of the exhibitors was a breeder of Cyprian queens, and had on exhibition a nucleus, headed by a queen which, he claimed, by a certain process which insured her mating with selected drones, was, though bred in Europe, *purely mated*. And as *pure bees* this nucleus was entered for competition, and received a State medal! Yet they were miserable hybrids, with scarce a trace of Cyprian blood about them! I do not think there was any favoritism about the matter. The breeder was not present, and I do not think he knows the judges personally, though they are, at least two of them, prominent in bee-circles, and their articles grace the columns of the *Eichstädter Bienenzeitung*. Three years before the time of this exhibition, the breeder in question had obtained from me in Cyprus, where only Cyprian bees exist, a pure queen, and I quite believe that even to this day, he thinks he is supplying *pure Cyprian queens*, and therefore makes the announcement he does in recent German bee journals.

That Mr. Fiebig has only seen such bees as those referred to above, is evident from his description of them. He says: "They are in size about the same as the North Germans and Italians, appear to be somewhat more

powerful." *Pure Cyprians* are decidedly smaller-bodied than any race of bees found in Europe. Their bodies are slender, gracefully pointed, wings large, and movements very brisk as compared with the most active Italians. They are strong in flight as well as quick, the high, sweeping winds of Cyprus having caused their wings to develop greatly. Add to this a vital energy, equalled by no European race, and we have in the Cyprians a race whose individuals invariably come off victorious when having no worse enemy than the most active of European bees. Cyprians cannot be robbed by other bees. I have seen the workers dart into the air a foot to drive robbers away that were hovering no nearer their hive entrance than that. Woe betide the luckless Italian or German colony that Cyprians take it into their heads to rob!

Mr. Fiebig says: "Their color is similar to the best Italians, and their breast is also of a yellow tinge." He would have done well to have said: The best Italians approach—a long way behind, the Cyprians in color. *The latter are the yellowest bees known*. Besides three bright yellow bands, which with Italians are not always present, or, if present are often dark copper or leather-colored, the Cyprians have a bright orange-yellow humle on the thorax between the wings, the under side of the abdomen is bright yellow, nearly out to the tip, and in general the body is covered with a brownish or nearly golden-colored fur, instead of "yellow and white," as mentioned in Mr. Fiebig's paper.

"Their inclination to swarm," says Mr. Fiebig, "exceeds that of the Heath bee and the Carniolans." No more incorrect statement is to be found in the paper. Even in Australia, where ordinary bees, say nothing of those great swarmers, the Heath bees, over-swarm often, the Cyprians have given no trouble on this score.

Let Mr. Fiebig get pure Cyprians thoroughly aroused once if he believes "their rage when stinging is not so great as that of the Italians." A score of them will show more energy with their wrath and business-ends than he ever saw a whole swarm of sleepy Italians, or blacks. But on the other hand, properly managed, no bees remain so quiet on the combs, and need so little intimidating. Mr. Fiebig, when he says that, "at an Exhibition of the German General Beekeepers' Association, several colonies of Cyprians were on view, and it was impossible for him to open a single hive without instantly having face and hands full of stings." When he says this, I repeat, he admits that he is, or was then, a fearful blunderer with bees, or else he must be excused on the ground that he had had no opportunity of learning how Cyprians are to be manipulated with the utmost safety and ease; or again, he may have had hybrids with scarce a trace of Cyprian blood about them—such as I saw at one of these shows. At any

rate, since the introduction into South Australia of Cyprian bees, direct from Cyprus, by certain enterprising beekeepers there. Mr. Fiebig has had an opportunity of learning something more about them, and when he saw them manipulated without the use of veils, and with but little smoke, nothing else, saw how exceedingly quiet they were, he was surely not a little staggered, and had, in order to sustain his previous statements, to seek about for some prop. He found it in the absurd, I almost believe maliciously intended, statement that "the bees imported into South Australia from Cyprus, are not pure Cyprians, but have been crossed with Italians." Be it known (1st) that an Italian bee has never been brought to the Island of Cyprus, and none but pure Cyprian bees exist there. (2nd) Previous to 1880 two Italians, queen breeders, had imported Cyprian bees, and one of them had even made a journey to Cyprus after them. Moreover, I have repeatedly filled orders for Cyprians given me by queen breeders in Italy and Italian-Switzerland, who have imported the yellowest and most energetic of all races—the Cyprians, to give a gold color, and infuse greater activity into a race that is gradually losing its feebled. Again, I may add that a Greek priest of Cyprus, to whom I had given some instruction in beekeeping, once wrote me to bring him an Italian queen. However, I did not comply with his request, but after my arrival there, convinced him of the folly of introducing Italian to adulterate the pure blood of the valuable race of Cyprus. And I now hope Mr. Fiebig will see the lameness of his plea, and, instead of seeking to justify his former position will admit him—If mistaken for once. I am sure, if he belonged to the Anglo-Saxon race, he would feel that an honorable and, under the circumstances, a very wise thing to do.

Let us examine a few more of Mr. Fiebig's statements. He says "that Palestine and Syrian bees are crisscross only of the Cyprians!" Palestine resembles Egyptians more than any other race, yet form an entire people, a link between Egyptians and Syrians, the latter serving to connect Palestine and Cyprians. All the Eastern races have some points of resemblance, one with another, yet I think think their qualities are sufficiently distinct to enable one to classify the bees of Cyprus as one race, those of Syria as another, &c.

Mr. Fiebig says, "Cyprians are to be found in Southern France, Sicily, Canania, and the island and coasts of Asia Minor." Absurd! The bees of Southern France belong to the common black race, but are rather greyish in type, those of Sicily are hybrid Italians, the race of Canania is yellow, yet less constant than the Cyprians, and I cannot believe as energetic, while their difference in form, markings and temperament, are sufficient to

rank them apart from Cyprians; the bees of Asia Minor are very irregularly banded with yellow, and do not in any respect equal the Cyprians as an established race, nor resemble them greatly. On the island of Scio, near Smyrna, I saw bees having sometimes one rusty-red, or again, a dirty white band, and at other times two such bands, the second one indistinct. These workers were rather large, and the general color of the body was greyish-black, so that though far from Greece and near to Asia Minor, they do not resemble the bees of the last-mentioned region; but rather the famous Hymettus or Attic bees, such as I found ranging on the wild thyme, still luxuriating on those classic hills.

Finally, Mr. Fiebig says: "Cyprians were imported from Cyprus about fifteen years ago by Count Kolowrat." While this is true as far as it goes, it only needs an addition, but it is likely to lead to an incorrect inference. In 1872, Count Kolowrat Kraskoway, and Mr. Ed. Cori, of Bohemia, imported Cyprians, and from this importation the first queens were bred and sent out. But "honor to whom honor is due." The first Cyprian bees landed in Europe were imported in 1880 by Mr. Chabone, who for many years previously had been experimenting with all known races he could procure, and from his experiments, and observations on Egyptians, Syrians, and other races, had come to believe a race superior to any of those about him, would be found upon some isolated middle part of the Eastern Mediterranean, and actually found that race in Cyprus—where the children of Beury, born of the sea foam, once held sway. Cyprus, now deserted and lonely, but which was once the meeting-place for all that was beautiful of the known world, which, as Chaucer long ago said, "bloweth in the grey, ancient time, through great fertility and wonderfully rich culture."

LARAR CYPRIAN.

FRANK BENTON.

THE PAST SEASON IN NEW ZEALAND.

NO.—I am glad to learn that you have decided to continue the Journal, and I sincerely hope those in whom interest it is published will duly consider the matter, and afford you that support you have a right to look for, and which it will be to their gain to give you. Please keep me on your list of subscribers.

I shall have pleasure in forwarding you from time to time, notes on beekeeping matters from this part of New Zealand, and keep you posted on bee matters generally in the colony.

Our last season generally throughout New Zealand, proved a very poor one for honey, and in many cases a disastrous one for bees. The Spring opened out very promising, the vegetation was in a more forward state at the beginning of October than I had seen it for many years; the clover blossomed abundantly,

and was at least a fortnight earlier than usual, giving promise of a large yield of nectar. In anticipation of this, I shifted nearly 200 colonies toward the latter part of October to a spot about five miles from their former location, where there were some thousands of acres of the richest clover you can imagine in full blossom. It was, indeed, a glorious sight, one calculated to drive a beekeeper rapturous; a vast extent of country covered with a thick white mantle of clover blossoms that could be plainly seen for many miles. All that was now wanted to make it a complete paradise for bees was a general rise in the temperature and warm nights, but this nature persistently refused to give us, with the exception of an hour or two about mid-day, the weather kept remarkably cold, especially at night time. This, of course, prevented the secretion of nectar, and it was very tantalizing to see such a grand show of blossoms with scarcely a bee working on them. Day after day right through the month of November the same low temperature was maintained, the bees gathering very little honey, barely enough for immediate use; I at last began to think we should have no honey weather while the clover blossoms lasted, but early in December the temperature began to rise, and the nectar started to flow; the bees were working like mad, and every preparation was made to keep them at it, expecting to have to keep the extracted constantly going for a few weeks; but, alas! for human expectations, frosty nights set in just as the hives were getting filled and ready for depriving, which cut off the flow, and right in the middle of December we were visited by a very severe frost which extended to nearly all parts of New Zealand, cutting down clover, potatoes, etc., and doing an immense amount of damage; the blossoms and leaves of the clover were now of a dark rusty color, as though a fire had run over it. I now despaired of getting anything approaching an average crop of honey for the season; as I calculated it would take at least three weeks for the clover to recover, and by that time the season for it would be drawing to a close. To add to our misfortune, hot, dry weather set in after Christmas and lasted till May; vegetation was quickly burnt up, through the extraordinary weather we experienced, so you see that we have had an unusual and disappointing season.

Our honey crop only amounted to about three tons, whereas I expected fifteen or more; I estimated the output for New Zealand from a number of reports received, to be about one-third of a crop or less, compared with the previous season.

Foul brood is seriously militating against the success of apiculture in this colony. It is time some vigorous steps were taken to keep it down, and to stamp it out if possible. With this end in view I have addressed a letter to our Government now sitting in Wellington,

asking for aid; the letter will be published in next month's *Farmer*. By the way, you mentioned to me one time about corrosive sublimate as a cure; will you kindly publish it, for I do not remember seeing it mentioned before. Poor seasons and unusual attacks of disease appear to go hand in hand; at all events, it has been the case here the past season, for foul brood has played sad havoc among the bees since this time last year. I hope, however, to get our Government interested in the matter, and so give us that aid we so much need just now.

I have written in haste, being anxious to be in time for the first number of your new volume, and our mail goes out to-day. I will give you more general news in my next.—Yours in haste,
J. HOPKINS.

Box 290, P.O., Auckland, N.Z.

BALLING QUEENS.

No. 36. I have on two occasions lately seen bees ball their own queens — their own mothers.

Last autumn a stray swarm settled in my garden. It was a very small swarm, but I lived it with a view of uniting it with one of my own stocks. I was examining it a few days afterwards, and I found the queen balled. I released her, and placed her in a cage, plugging up the month with a piece of comb; next day she was out of the cage, and all right.

Two days ago I was looking at a rather weak colony, that I have been treating for foul-brood, when I saw a bunch of bees on a comb. I gently disturbed them with a stick, and when I got to the centre of the cluster, there was the queen, unmistakably balled. In this case I at once closed the hive, and on examining the hive to-day I found the queen all right on a comb.

I have not been able to find anything bearing on this point in any of the bee books I have, and the only thing that I can see that refers to anything of the kind is in *Roots' Gleanings*, for this year, page 26.

Reference is there made to a page in a previous number, but as I have not got last year's *Gleanings*, I cannot follow the matter up further.

Will you let me know, through the medium of your journal, what is known about this matter. It has an important bearing on the introduction of queens, because if opening a hive will cause the bees to attack their own queen, will it not be much more likely to have that effect when the queen is comparatively strange? — I am, &c.,

H. LINDSAY MILLER.

Warruambool, 24th May, 1887.

[It is not an uncommon thing to find bees "balling" their own queen, but that "balling" is usually for a very different purpose from that of balling a strange queen. Bees ball

strange queens for the purpose of destroying them; but in most instances when they ball their own queen, it is for protection. In the first case cited above, there were probably strange or robber bees entering the hive, and the queen was surrounded for protection. In the second case, there can be little doubt that the stock, weak from foul-brood, had been attacked by robber bees for the honey, and the queen was simply balled by her own bees to protect her. We had a case last year, where a queen, confined in a cage in a strong hive, escaped, and in the evening the old queen was found encased, evidently to protect her from any attack of the escaped queen.—*Ed.*

Extracts from Foreign Journals.

OUTLINES OF BEEKEEPING FOR BEGINNERS.

From British Bee Journal.

I.—WHERE BEES MAY BE KEPT, AND WHO IS SUITED TO KEEP THEM.

1. Bees can be kept in any place where there is a small piece of garden, and fields, meadows, or heath, within easy reach, more especially near orchards and fruit gardens, or where clover, sainfoin, mustard, rape, and buckwheat are cultivated.

2. The best spot to select for placing the hives is in a garden not far from the house, where they will be sheltered from wind and free from disturbance by strangers, and out of the way of domestic animals. It is very important if such a sheltered place cannot be found, to plant a hedge or other wind-guard on the northern side of the hives; and if there are a few fruit trees about, so as to shelter the bees from the fierce rays of a summer sun, it would be an advantage.

3. Most persons can keep bees if they have sufficient time to spare during summer, when most of the work has to be done. Even the cottager, who is at work from morning to night, will be able to devote a little leisure time to this pursuit, which will add to his income in an agreeable manner. Any one who is sufficiently vigorous and strong, and can still lift from fifty to sixty pounds in weight, can walk without assistance, and has good eyes, sharp enough to distinguish a bee's egg at the bottom of a cell, is able to keep bees.

4. The object of keeping bees is generally either pleasure or profit. If they are kept for pleasure, it is better to have only two or three hives, but if profit be the object, the beekeeper should possess at least ten or a dozen hives. In either case not more hives should be kept than can be properly attended to, for one hive well looked after will make a better return than a dozen that are neglected.

5. There are some districts where bee-pasturage is so scarce that the bees, even in the

best seasons, cannot procure the necessary stores to keep them through the winter. These are not suitable districts for keeping bees.

6. Places, exposed to the wind, or on the borders of wide rivers and lakes, where there are many manufactories, such as breweries and sugar refineries, which allure the bees, who then meet with certain death, are also not suitable.

7. Those who suffer so severely from a sting as to be obliged to call in a doctor, or take to their beds, or who have not sufficient courage to bear calmly an occasional sting, or who will not attend to their bees themselves, and are not able to make their hives, or have not got the means to procure them, or will not, if needed, feed their bees when they are in want, had better not undertake beekeeping.

II.—HOW TO COMMENCE BEEKEEPING.

1. The beginner should never make a start on a large scale. He had better commence with one or two hives, and increase as he gets experience, not forgetting that there is a great deal to learn—although not more than anyone with ordinary intelligence can manage—before he can expect to be a successful beekeeper.

2. The best time to commence is in the spring, and it can be either by the purchase of a swarm, or a stock of bees in a skep or a wooden hive. If the beekeeper decide on the purchase of a hive, he should secure this from the nearest beekeeper of his neighborhood in the beginning of April. If he is not able to afford the cost of such a hive, he will have to begin with a swarm, which he should secure in May or the beginning of June.

3. If he has had no previous experience in keeping bees, it would be better for him to consult, and get the help of, the county expert, or if he is not able to do this, to enlist the services of a practical beekeeper in his district.

4. Should he not be able to get any such help, he must try and get a swarm from a hive which was known to have swarmed the previous season, because the queen of such a swarm would be a young one and in her prime. The larger the swarm the better. The beekeeper can judge the strength of the swarm by its weight or measure. Three pounds of bees, or a little more than a gallon, would be a medium swarm, and five pounds, or about seven quarts, would be a good swarm.

5. Much greater care should be exercised in purchasing an old hive, and it should be well examined before it is taken. If in a skep, blow in a little smoke at the entrance, and after a few minutes turn it up. The hive should be full of bees, and these can be driven down with a few more puffs of smoke. (Instead of smoke carbolic acid can be used; but this will be explained in another chapter.) Examine the combs, and see that they are free from mould, and if, on pushing them apart, brood is found, it shows that the queen is present. The combs should be straight and regular,

coming down to the bottom of the hive. If the combs in such a hive are not too black or old, it can be purchased, especially if it had swarmed the previous season. This hive can be kept for supplying swarms, or the bees can be driven and the combs transferred to a frame-hive in the manner to be explained later.

6. If the purchase of a frame hive has been decided upon, the same observations should be made while the beekeeper is taking out the combs and examining the hive. If the operator is a skilful one, and his movements are carefully watched by the beginner, this will be as good as a lesson for him.

7. Make up your mind to be guided by the instructions given for at least two years, with what help can be obtained from the expert or a friend, and only after that try experiments.

DESIRABLE POINTS WHICH SHOULD BE COMBINED IN THE MODERN BEEHIVE.

By HENRY ALLEY.

From American Agriculturist, Jan. 1, 1887.

1. The brood-nest should contain, according to the best authority, and results of actual test, about 1500 cubic inches.

2. The frames should be so constructed that the combs can be easily and quickly removed without killing or crushing any bees.

3. The brood-nest as well as the frames should be invertible, and the latter so constructed, that they may be reversed singly or in body. It often happens that, in handling, a comb will crack off at or near the top bar. If the frame can be inverted the bees will soon repair the damage.

4. The hive should be supplied with one or more division boards, or dummies, so that in case it is desirable to shut off the queen from any number of combs, or to close the colony down to a "one" frame, it may be done without much trouble. It is important to have the parts so arranged that all manipulation may be easily executed. A hive full of open joints, or those that are too close, or one that requires much prying to open and pounding to put it together is a nuisance in any apiary.

5. A hive should be so constructed that it will winter a colony of bees safely on the summer stand, and be so light that it will not require the aid of several persons to carry into the bee-house or cellar. A hive that is three or four feet square, and is so large that it cannot be lifted by one person, does not come up to the requirements of modern bee culture. In case it is desirable to winter out of doors, the hive should be made so that it may be readily packed, and the packing as readily removed when necessary.

6. A hive should be so made that the surplus storage will admit of from one case of section to an unlimited number. The experience of the past season has demonstrated one fact to

us, namely: that four racks, of 24 one-pound sections each, may be used on a hive at one time, and to the best advantage.

7. A hive should not have over eight brood-frames about the same size as are used in the Standard Langstroth. In this opinion we are backed by a large number of the experienced and practical apiarists in the country; in fact, no one claims that a large brood-nest is necessary in any case.

8. A hive should be convenient and practical and well adapted for either extracted or comb honey.

9. The most desirable hive is the one that requires the least amount of labor and lumber in its construction. Every part and piece should be gotten out with a circular saw, and no planing or jointing should be necessary after it is ready to nail. A hive should be so constructed that, when packed for winter, water cannot reach the packing. One not so made is worthless for wintering use, and not as good as one not packed at all. All beekeepers know the importance of having the packing very dry and clean.

10. A hive should be adapted to either a hot or cold climate. One to combine the last two points should have a large open space under the combs and frames, as such a space affords ample ventilation both summer and winter. Bees in a hive thus constructed will not "lay out" in any climate, provided the entrance is a large one. Nor will the combs melt down in summer, nor mould in winter.

Queries and Replies.

Question 1.—I have had great difficulty with all my sections and shallow frames in my supers.; in nearly every case they were so firmly fastened to the frames of the brood chamber beneath by wax and propolis, that I broke many sections, and tore off the bottom bars of the shallow super frames in removing them. Can you, Mr. Editor, enlighten me, and perhaps a good many others, on the best way to prevent the bees fastening everything this way; or, if it cannot be prevented, what is the best way to separate the sections and frames from the frames below?

H. J. B., Gippsland.

Question 2.—Can the extractor be used for extracting honey out of combs cut out of box hives, and will any sized piece of honeycomb go into the extractor? How much does an extractor cost?

HONEYDEW.

Question 3.—Please tell me, Mr. Editor, if I can make a frame hive out of a gin-case, or any packing case about the same size? And I shall be very thankful if you will give some notion of how to do it, in your answering columns.

J. S., Upper Yarra.

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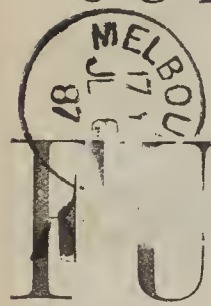
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JOURNAL.

VOL. II. No. 2.]

JULY 10, 1887.

[PRICE 6D.

Editorial.

NEW BOOK.

We have received a copy of the *Australasian Beekeepers' Guide Book for Amateurs*, by Charles Dickins of Adelaide (Seryngour and Sons, Printers, Adelaide), which cannot fail to reach the hands of most beekeepers. It is freely illustrated throughout, and is issued at the very modest price of a shilling.

In about 38 pages of matter, the leading principles of the modern systems of apiculture are treated of in a concise and pithy style. The illustrations throughout are just what will make the book thoroughly useful to beginners and amateurs, and even to more advanced apiculturists. The articles on the various appliances and operations of the art are necessarily brief, but the descriptions, directions, and advice are all sound and well chosen. We welcome the appearance of such a useful little book, and wish the editor every success.

We are requested to call attention to the following circular which has been issued by the *Victorian Beekeepers' Association*. The oldest Australian Association is that of South Australia; the next in seniority, we believe, is the Victorian Association, followed by the Queensland Beekeepers' Association, which was started last year. We hear that steps are now being taken to form a similar Association in New South Wales, and wish our brother apiarists there every success. We hope, with the members of the Victorian Association, that at no very distant date these various bodies will themselves associate, or to use a now well-worn term, "federate," into one large Australian Association each having extensive ramifications in the shape of branch associations throughout their respective

provinces. The circular referred to is as follows:—

"VICTORIAN BEEKEEPERS' ASSOCIATION.—This Association was formed in Melbourne in November, 1886, for the purpose of encouraging and advocating beekeeping in Victoria, spreading information concerning the modern methods of keeping bees and dealing with produce, the introduction into the colony of the best races of bees, &c. Hitherto it has held meetings in Melbourne only, at which reports and papers on apiculture have been received and discussions carried on. There have also been numerous exhibits of hives, bees and beekeeping appliances at the meetings. In order that the objects of the Association may be more fully carried out, it has become very desirable to establish Branch Associations at our country towns and other places where beekeeping is carried on, or where it is desired the industry may be established. By this means beekeepers in any locality could form a branch of the Association, meet together and discuss apicultural matters, exchange information, give or receive help and advice, obtain information and the loan of books, periodicals &c., from the central society, and generally derive such assistance and benefit as usually results from the friendly association of all those interested in the same pursuit. All country beekeepers are therefore invited to become members of the Association, and arrange for the formation of Branch Associations. The subscription to the Association is 10s. per annum for town members; for country members, however, it has been fixed at 2s. 6d. per annum, a portion of which will go to the central body for keeping up the library and distributing books and periodicals to the members, and a part to meet expenses of the branch. It has further been arranged that *The Australian Beekeepers' Journal*, which has just entered on its second year of issue, shall

be supplied to all members of the Association at the rate of 5s. per annum instead of 6s., so that a country member's subscription for the Association and *Journal* will be 7s. 6d. per annum, and a town member's subscription for the same will be 15s. per annum. The Victorian Association hope that all colonial beekeepers' associations will eventually combine to form one Australian Beekeepers' Association, and arrange for interchange of publications and of apicultural news, and for such other co-operation as may be possible and mutually beneficial."

HINTS FOR THE MONTH.

IN case the advice given last month to get everything ready for the coming season has not already been taken, we again urge that no time should be lost; for any beekeeper with more than half a dozen hives, who has other occupation to attend to, will find he is never ready for contingencies if he leaves getting all the little requirements for spring feeding and early stimulation, and for subsequent swarming, until the busy time comes. Little need be done with bees now if the hives have been properly cared for and are dry, but as it has been an unusually wet and damp winter so far, damp hives and mildewed combs will not be uncommon. A little top ventilation will be necessary, and entrances should not be kept too small; indeed, it is a question whether it is not better to have entrances open to their fullest extent in damp weather as well as in warm.

If any stocks are suspected to be short of stores examine them on some fine warm day, unless, as some beekeepers advise, the hives have been weighed before the winter set in, and can be weighed again now, when the weight will at once inform us of the amount of stores available without disturbing the bees. If hives are light, indicating shortness of provision, food should be at once given. And here care is required, the food must be given in a large quantity rapidly; slow feeding would probably encourage premature breeding and injure the stock. White sugar syrup, 2½ lbs. of sugar to the pint, will be the best food, and either give from 10 lbs. to 15 lbs. of this to a full colony in one large feeder, or give it in a smaller feeder that will feed rapidly, and refill from day to day until the necessary quantity is taken.

The plan of weighing stocks has certain advantages; those that are sufficiently heavy need not be opened or disturbed in winter time (a proceeding that always does harm except on the warmest days). To those who desire to adopt it we would say that a hive of the style in use should be weighed as well as similar frames, division boards, &c., to those in the stocked hives. Pass a sling of cord under bottom board and hitch over the roof, weigh it with any weighing apparatus of sufficient

capacity (a common steelyard or spring balances will be the best) and note the weight. A Langstroth hive of pine wood with 10 frames of empty combs will generally weigh from 24 lbs. to 30 lbs. Now, after weighing any stock, deduct the weight of the similar hive and frames as obtained and the remainder will give you the weight of the comb, bees, and honey. The weight of a Langstroth frame of empty comb may be taken as ¼ lb.; of an average winter stock of bees covering four or five frames as about 3 lbs., so that if a stock and hive weighs 45 lbs. and a similar hive empty 24 lbs., we shall have 21 lbs. for bees, comb, honey, and frames; as follows—

Total weight	45 lbs.
Weight of similar hive	...	24 lbs.	
Five frames of comb, empty	...	2½ "	
Two division boards	...	1½ "	
Bees	...	3 "	

Deduct total ... 31½ lbs.

Leaves weight of stores ... 13½ lbs.

which would be a fair supply in July to carry the stock into breeding time in spring.

A good plan to weigh stocks of bees at their stands is to use three light poles about 7 feet long, lash them together at the top, spread them out in a tripod form over the hive to be weighed; attach a spring balance that will weigh up to 80 lbs. or 100 lbs. to the lashing at top of poles. Put the sling above referred to under the hive, spreading the two parts under the bottom board so as to lift the hive fair, and hook the balance through the bight looped over the roof, then spread out the legs of the tripod till the hook of the spring balance is low enough to hook into the sling, then bring the legs together one by one, step by step, till the whole weight of the hive is on the balance and the weight obtained, when the hive can be lowered by reverse process. This can all be done so gently that no disturbance whatever is caused, and the bees will be flying in and out quietly during the whole process.

SOLAR WAX EXTRACTORS.

ONE of our subscribers asks for information about Solar Wax Extractors, and how to make and use them. We are glad to give him, and our other readers, what information we can upon the subject.

In many countries where clear skies and a pretty high sun prevails in summer time, it is an easy matter, with a little ingenuity, to obtain enough heat from the direct rays of the sun to melt wax, or even to boil water and raise steam.

In California, and the hotter parts of North America, it appears to have long been a common practice to use the sun's heat for separating honey and wax, as well as for smelting wax alone.

The apparatus is very simple, and usually consists of a wedge-shaped box, in some cases from six to ten feet long, and two to four feet wide at the top, tapering to nothing at the bottom, at a depth of from one to three feet. These boxes are lined with tin on the sloping sides, and are covered with one or two sheets of glass, separated an inch or so one from another. Halfway down this V-shaped box, a perforated tin stage is placed, resting on projections in the sloping sides. On this stage the combs are placed, and any crystallised or thick honey that they contain soon runs out, while the combs themselves quickly melt, the wax running into the bottom of the box—the honey beneath, and the wax over it. If a pipe be soldered into the tin lining of the box the honey can be run into any vessel placed under the pipe, and if the heat be sufficient the wax will eventually run also. There are certain advantages in wax extractors of this kind, for it is stated that the slow melting process produces wax of a better color than steam melting; and where it is desired to separate crystallised or viscid honey from the combs, which cannot be done by the extractor, the sun method certainly seems to be the best. The principle of these extractors lies in the fact that, heat rays falling on the combs in the box, are not dissipated by currents of air or by radiation, by reason of the glass coverings; while the sloping sides, covered with bright tin sheet, act as reflectors to throw the sun heat from a large area on to the comb, and heat accumulates till a high temperature results. Of course, the box must be placed so that the glass is perpendicular to the sun's rays at noon, and the length of the box lies north and south when the sides act as reflectors, both in morning and afternoon.

Small extractors may be easily made; and a large basin-shaped strainer of tin, inside a square box, covered nearly air-tight, with a sheet of window-glass properly exposed to the sun, does very well for small operations. Of course, a receptacle must be placed beneath the strainer to catch the honey or wax, or both. As melting wax is very attractive to bees, care must be taken that there is no opening left by which they can get in the extractor, as all that enter will most probably be killed.

By keeping the above principles and particulars in mind, it becomes an easy matter to devise a Solar Wax Extractor of any convenient form or dimensions, which would be thoroughly effective in our Australian summer sunshine.

DISAPPOINTMENTS IN BEEKEEPING.

(Continued from Page 6.)

CASE 2.—Mr. N. had a fine frame hive of Italian bees from a neighboring colony. His surroundings were highly favorable for profitable bee-

keeping. He was timid about handling them at first, and they got on well, and rapidly filled up the frames; soon after he got over his timidity and examined the hive, and was delighted to find the bees were so gentle, that he could handle them with impunity. He therefore, frequently took out the frames to see how things were going on, and to "sight the queen," as he said. Then he began to shew his friends his beautiful Italian queen, till sometimes the hive was opened two or three times a day, whatever the weather might be. One day he found the bees bringing out dead grubs, and then there were further and frequent "lookings" to see what was the matter. Breeding ceased, dwindling commenced, and four months after he got his bees, there was scarcely enough to cover half one frame. Too much interference with bees at breeding time is almost as bad as disease, and often brings it about.

Mr. N., at our advice, got a stock of black bees, and united them with the residue of the Italians and their queen, and then left them alone; the consequence is, he has now several good, healthy stocks which are thriving, and gave him a fair amount of surplus honey last April. He surmounted his first disappointment, and gained his first experience, and now swears by the non-interference method in beekeeping.

CASE 3.—A young farmer had a swarm of black bees given him in October last, and he intended to try his hand at beekeeping, as he was well situated as far as bee pasture was concerned, but wisely thought it best to obtain experience with one hive before trying on a larger scale. His swarm was in a box hive; the bees seemed to do well at first, but in a few weeks there seemed to be less and less bees at work, and while his neighbors' stocks were increasing in strength and weight, every day his box got lighter and the bees fewer. He believed the bees had some disease, but when he examined the stock, he found the queen with her wings ragged, and barely more than stumps of wings, not an egg to be seen in any of the combs; there was, however, a too large proportion of drones, and several cups formed for queen cells, but without eggs. This case was a very common one; the swarm he obtained was one led out by a very old and exhausted queen; her last efforts at population resulted in drone eggs, from which probably the bees themselves had made futile efforts to raise a new queen; in this state the bees were rapidly diminishing. I got a young hybrid queen for him, and in about a month things assumed another aspect; the bees increased rapidly, all combs were soon after fully covered, and by the new year the hive was overflowing, and on the 18th of the same month gave a bumping swarm, which he safely hived alongside the parent stock. Our young farmer is now an enthusiastic beekeeper, and considers himself an experienced one. He says he will

examine the wings of any future queen he lets into his apiary.

This is an instance of how many disappointments in beekeeping occur, and rather points to the desirability of experts in giving the benefit of their advice and experience to assist beginners in their own neighborhood.

(To be continued.)

NEW BEE JOURNAL.

JUST as we are going to press with our second number, we have received a copy of the first number of *The Australasian Bee Journal*, published in Auckland, N.Z., by Hopkins, Hays & Co.; J. Hopkins, editor. Our readers will remember that about four years ago, the first (we believe) Bee Journal published in Australasia appeared, entitled *The New Zealand and Australian Bee Journal*. Two years ago this journal became incorporated in the *New Zealand Farmer*, in which most valuable and interesting articles on Beekeeping appeared regularly. The apicultural industry in our sister colony, appears to be making good progress, for now again the journal emerges from its two years' seclusion in the pages of the *New Zealand Farmer*, and comes to us once more standing alone. The journal is like our own, a 16-page pamphlet, slightly larger than *The Australian Beekeepers' Journal*, and capitolally printed on good paper. The subscription is six shillings per annum, and the subject matter, under the able pen and direction of Mr. Hopkins, is of course practical, useful, and well selected. We hope to get some valuable pickings from our New Zealand contemporary, and trust the editor may get some scraps occasionally from ours. We see an abstract from our pages already, namely, Mr. Naveau's communication on "Corrosive Sublimato" as a cure for foul brood, and at the foot thereof the editor questions the necessity of using distilled water for making the solution. The answer is this, that unless pure water be used the mercury is soon deposited from the solution by the presence of minute quantities of alkalies, or their salts, or of vegetable matter; by using distilled water it keeps active much longer than if any ordinary water is used. We are sure are readers will join with us in wishing *The Australasian Bee Journal* a wide circulation and complete success.

PRODUCTION OF COMB HONEY.

THE American Apiculturists, having invited essays on this subject from several of the most experienced apiarians in America, publish in their last issue several of these papers. These are so practical, useful, and suggestive, that we intend giving pretty full abstracts of them in our columns of succeeding numbers for the benefit of such of our readers as are working, or intend to work for comb honey.

INTERCOLONIAL BEE NEWS.

TASMANIA.—The Bee Talk by "Apiarian," in *The Tasmanian* of 11th June, speaks upon the question of Pure Italian Queens, and what constitutes the distinction between pure and impure (or hybrid) Italians. "Apiarian" admits this to be a difficult subject, and gives the opinion of several prominent American apiculturists. It certainly is very doubtful what constitutes the characteristics of a pure Italian bee. The anatomy of the species is similar, but the marking of the varieties forms a very doubtful criterion, and we believe that if a breeder of queens obtained a specially marked variety by crossing a North or South Italian bee with an Egyptian, Tunisian, Cyprian or even South African bee, and called the result pure Italian, he could scarcely be contradicted, so long as his bees are marked by the three yellow bands. If one possesses a stock of bees, the most of which shew the three yellow or light-brown bands when their abdomens are extended, he should be satisfied they are as pure as need be. It is very difficult now-a-days to ensure pure mating of purely-bred queens, unless places can be found where no other bees exist, and where young queens can be sent with selected drones until they commence to lay. Such places may be found on some of our large plains, but nowhere else, I imagine, as our little black *apis mellifica* is almost ubiquitous where food is to be got.

Our experience is that for honey gatherers, and for hardy profitable bees, none beat the first cross or two, between a pure Italian queen and blacks, or Cyprian and black; these bees, the first cross especially, are often as gentle, or gentler than the Italians themselves, and always give us less trouble and more profit than the pure races. "Apiarian" in Bee Talk, No. 49, mentions the importation of Ligurian bees by Mr. Edward Wilson, into Victoria twenty-two years ago. This is quite true, as is also the fact that the strain soon got lost, and that it is a very common thing now to find bees wild in the bush, with a trace of the orange-colored *lunule* on the back of the thoracic segment of the abdomen, indicating a streak of Italian blood.

Proceedings of Beekeepers' Associations.

S.A. BEEKEEPERS' ASSOCIATION.

THE annual meeting of the above association was held on Thursday evening. The chair was taken by Dr. Cockburn, M.P., who in the course of his remarks said that as a member of the association he felt great interest in the beekeeping industry, which was increased by the fact that the district he had the honor to represent in Parliament was probably the largest centre of honey-production in South

Australia. He also referred to Messrs. Chaffey Brothers as enthusiastic apiarists, and to a letter which he had received from Dr. Poulton, with a request that he would read an extract from the *British Medical Journal* (London), which ran as follows:—"Eucalyptus Honey.—Mr. Thomas Caraman, on the strength of his own observations, believes that eucalyptus honey is destined to render great services in cases of laryngeal, bronchial, pulmonary, cardiac, and scrofulous affections, in typhoid and marsh fevers, in whooping cough or infectious neurosis of the expiratory nerves, in influenza, and affections of the bladder. Given in milk, or spread upon bread, eucalyptus honey may be substituted for cod liver oil as an alimentary substance." The annual report was read, from which it appeared that the society was progressing satisfactorily, and that eight new members had joined during the year. The production of honey, both as to quantity and quality, had not, however, come up to the anticipation of beekeepers, and in fact had been somewhat disappointing. The committee strongly recommended that means should be adopted for educating the public as to the value of honey as a food directly, and in domestic economy generally. The wisdom and expediency of reserving Kangaroo Island solely for Ligurian bees had been demonstrated during the past season by the great demand for them. Numerous papers had been read and discussed during the year. The balance-sheet showed the receipts to have been for the year £16 12s., and the expenditure £13 9s. 4d. Mr. Molinex, in moving the adoption of the report, expressed the hope that legislative power would soon be given to beekeepers to deal with foul brood in all apiaries. The laws in respect to contagious diseases in stock, and other pests which affect rural interests, were in so unsatisfactory a condition as to render it imperative upon the Legislature to deal with those subjects. Mr. Clough, in seconding, said that the annual honey crop in America was 100,000,000 lbs., value 10,000,000 dollars; and the annual wax crop 30,000,000 lbs., value, 6,000,000 dollars. The following officers were elected for the ensuing year:—President, Dr. J. A. Cockburn, M.P.; vice-presidents, Messrs. A. E. Bonney and C. F. Clough; committee, Messrs. Coleman, C. Dickens, Dollman, R. Fiebig, Miller, Molinex, W. Stevens and Walters; hon. sec., Mr. F. A. Joyner; and hon. treasurer, Mr. W. Randall. Votes of thanks was accorded to past officers, and special reference was made to the services of Sir R. D. Rose in relation to beekeeping generally, and especially with regard to the introduction of Ligurian bees, and the isolation of Kangaroo Island for the purposes of Ligurian beekeeping. Mr. A. G. Bonney detailed the particulars of a visit he paid to an apiary owned by Mr. S. Macdonnell and managed by Mr. Abram at Parramatta, about six miles from Sydney. He found there 250 colonies of pure Italian

bees in Berlepsch hives arranged in a shed 150 x 13 feet. The amount of honey taken last season was 7000 lbs. from 240 hives, and in the previous season 15,000 lbs. from 160 hives, the chief honey source in September being orange trees, and in December gum trees. The season had been very short and the honey taken chiefly with the extractor, being put up in glass bottles, tins and kegs. Mr. Bonney stated that Mr. Abram found a good sale for the production of his bees. A discussion followed upon the prices realised for honey, and many suggestions were made as to the methods of enlightening the public relative to the uses to which this valuable food may be put. Mr. Charles Dickens exhibited a number of interesting bee fittings and appliances; also objects under the microscope.

Original Contributions.

HIVES.

(Continued from page 9.)

DESPITE the cost of frame hives the profit of beekeeping is far greater with them than with boxes, and if a beekeeper, with from 10 to 50 box hives, makes the business pay, he would make it pay better, by three or four fold, with frame hives under the same circumstances. Therefore anyone intending to make beekeeping his chief business must adopt the frame hive to obtain the best returns. One good season will cover his outlay and leave him in a position to realise cent. per cent. on every good season after. No Swiss, French, German, English, or American apiculturist, who makes the art his sole or an important business, would ever dream now-a-days of using box hives; still they will, no doubt, continue to be used by cottagers and others keeping a few stocks for providing their own house with honey or having a little to sell to their neighbors.

The term *frame hive* is a very general one, inasmuch as the varieties of form are very numerous. The sizes of the frames adopted differ very largely as well as do the size shape and character of the boxes in which the frames are placed to form the hive. The various operations necessary in a modern apiary render it very desirable that the hives and frames should be all precisely of one size and pattern, so that everything shall be interchangeable. If frames are required to be taken from one hive and placed in another (a proceeding constantly required in proper management), there should be no doubt of their fitting exactly without any alteration; or if one hive has to be placed on the top of another, or bottom board exchanged, the careful beekeeper will never be in the difficulty of finding they do not fit. Hence the desirability, or indeed absolute necessity of having all hives in an apiary kept for profit,

of the same exact pattern throughout. A frame hive consists of several parts designated as follows:—1st, the bottom board on which the hive stands which forms the floor of the hive; 2nd, the *body, box*, or brood chamber; 3rd, cover or roof; 4th, the frames which fit into the brood chamber. These together would form a *one-storied hive*; if it were two storied, there would be two bodies, or boxes, one above the other, and frames in both, surmounted by the roof. Or it may be a one-and-a-half story hive where a shallow box half the depth of the brood chamber is placed above it, to contain shallow frames or section boxes; or we may *tier up* two, three, or more boxes of the full size one above the other, each box containing its frames or sections and the roof surmounting all.

It will be useless to describe here the various forms of frame hives in use in Europe, America, and elsewhere; for full descriptions can be found among the various bee books; moreover, the Australian Beekeepers' Associations, have agreed among themselves to adopt the form known as the "*Langstroth Frame Hive*."

The dimensions of the several parts of a Langstroth hive are as follow:—

1st. Boxes, inside measure, $18\frac{1}{2}$ inches by $14\frac{1}{2}$ inches by 10 inches high. These are generally made of boards $\frac{3}{4}$ of an inch thick. This size is used for brood chambers and for full storys.

2nd. Half-story boxes are the same dimensions as the boxes or brood chambers, but 5 instead of 10 inches high.

3rd. Bottom boards are made in various ways; they are generally constructed of $\frac{3}{4}$ inch board, either in one piece or jointed, being cleated underneath with 2×3 quartering, or stuff at least $1\frac{1}{2}$ inch thick; I think 2×3 quartering is the most satisfactory. The actual size of the bottom board will depend upon whether a separate alighting board is preferred; if it is, the board should be 16 inches wide, or perhaps $16\frac{1}{2}$ inches, and its length $20\frac{1}{2}$ inches or $20\frac{1}{2}$ inches; I believe the separate alighting board is best. If, however, the bottom board is to form alighting board also, its length should be increased by about 3 inches, making it, say, 2 feet from back to front, which will allow of projecting in front $3\frac{1}{2}$ inches for alighting board. It is, I think, desirable to have the alighting board separate, and fixed to the bottom board with pins or dowels, so that it can be removed and replaced easily; it should be made to slope downwards enough at its outer edge to throw off any rain that falls on it. Such an alighting board should be the whole width of the hive, and project about 3 inches.

4th. Roofs or covers can be made of almost any form; the two best for Langstroth hives are the sloping gable roof cover, as in the new simplicity hive, or the flat

roof, which is higher in front, and slopes enough towards the back to throw off rain readily. This latter is the cheapest, and most easily made, and is, I think, the most convenient, although not so picturesque as the gabled roof.

5th. Frames.—The proper dimensions of frames for Langstroth hives are as follow:—*Top bar*— $19\frac{1}{2}$ inches long, $\frac{3}{4}$ inches wide, and $\frac{3}{4}$ or $\frac{1}{2}$ -inch thick. *Bottom bar*— $17\frac{1}{2}$ inches long, $\frac{3}{4}$ inches wide, $\frac{1}{4}$ or $\frac{3}{8}$ -inch thick. *Sides or ends*— $8\frac{3}{4}$ inches long, $\frac{7}{8}$ inches wide, $\frac{3}{4}$ inches thick. The top and bottom bars are to be *nailed on* to the ends of side bars, so that the outside dimensions of the frame will be $17\frac{1}{2}$ inches wide, and $9\frac{1}{2}$ inches deep, with $\frac{3}{4}$ -inch projecting shoulders for suspending the frames on the *runners* in the boxes. If the top bar is $\frac{1}{2}$ -inch thick, $\frac{1}{8}$ -inch must be cut away from under side of each end for a space of $1\frac{1}{2}$ inches, and the side or end bar nailed close up to the angle, when the dimensions of the frame will come out right. Either $\frac{1}{4}$ -inch, or $\frac{3}{8}$ -inch thickness can be used for bottom bar; if the former, the end bars must be $8\frac{1}{2}$ -inches instead of $8\frac{3}{4}$ -inches to maintain the proper size to the frame. The frames have to be suspended in the box, or brood chamber, so that when in position, the upper surface of the top bar shall be even, or flush with the top edge of the box. This is done in this way where frames run from front to back, as is the case in the Langstroth. A rabbet is cut on the inside top of the back and front of the box, to a depth of $\frac{9}{16}$ inch, that is, from the top edge downwards, and $\frac{3}{4}$ -inch from within outwards; strips of tin about 1-inch wide, having the upper edge doubled back or folded $\frac{1}{4}$ -inch are now nailed on to the inside surface of the sides of the box below the rabbet, so that the folded edge projects just $\frac{1}{16}$ above the bottom of the rabbet. These tin strips are called *runners*, and if fixed as described, will carry the frames so that the surfaces of the top bars are level with the top of the box, and there will be just bee space in the rabbet beneath the shoulders of the frames, and also nearly $\frac{3}{8}$ -inch bee space between ends of frames and inside of box, and the same between bottom of frames and bottom board. This latter bottom space of $\frac{3}{8}$ -inch is now considered too small, as not admitting of sufficient space for the bees to properly ventilate their hive when much crowded in hot weather, and an extra $\frac{1}{4}$, or $\frac{3}{8}$ -inch altogether, is now advocated. To obtain this a $\frac{1}{4}$ -inch strip can be nailed on to the bottom board, at the two sides and at the back, exactly the same as the box itself; this leaves a $\frac{1}{4}$ -inch opening, the whole width of the front, for entrance. In order to

prevent any entrance of water at the joints where one box is put on another, it is usual to either put weathering strips outside, or more frequently, to rabbet $\frac{3}{4}$ -inch deep and half thickness all around the outside of the tops and the inside of the bottoms of boxes, and inside bottom of roof, cover frame, so that one part fits easily on to the top of another, and every joint is *break-joint* and weather-tight. If this is done, then the raising strips on the bottom board just referred to, should be rabbetted like the top of a box, $\frac{3}{4}$ -inch thick inside, and $\frac{1}{2}$ -inch outside; this allows all to fit snug. Some beekeepers consider it unnecessary to thus guard against entrance of water, and state that it is quite sufficient to have tops and bottoms of boxes flat, without rabbet or weathering, and that bees will keep out water with propolis.

(To be continued.)

Correspondence.

WHEN I was reading the report of the last meeting of the *Victorian Beekeepers' Association* I noticed several topics on which I should like to make a few remarks. One of these was about a preventative to bee-stings. As the natural inclination of the bee is not to sting everybody who approaches the hive, but only to defend itself against intruders, the stinging propensity may be greatly lessened by careful breeding; as kind treatment has a great deal to do with the gentleness of all our domestic animals, so I find it has a wonderful effect upon bees. Sometimes, when I am in my garden, where the hives stand very close together and I am using the hoe in close proximity to the hives and unintentionally strike the corner of a hive, in an instant out rush the infuriated inhabitants of the hive to see what is the matter, and woe be to the assailant if they meet him there and then. Again, supposing I want to inspect a hive, I go at it with care, removing the lid, lifting the quilt, putting in the nozzle at the smoker and give them a few puffs. They fill themselves with honey and, although they will not sting then, but seem to say to me, "the next time you come near our place we will give it to you for putting your nasty smoke in our clean dwelling." Now, gentlemen, this is just as it appears to me. But when I go to the hive, and after I have opened it carefully, present them with a gentle spray of liquid sweets, the sentinels instead of arousing the rest take to licking the sweets thus offered them and the result is peace and quietness. The latter maxim is Mr. Langstroth's, and he bears the palm. The best lotion to moisten your face and hands with to prevent stings is a mixture of honey and water.

The next is about forming branch associations throughout the colonies. This topic I have been repeatedly advocating through the press, but there it rests; the articles may be read with interest, but nothing definite has resulted from it. I have, therefore, arrived at the conclusion that if success shall be achieved an agent must be employed to visit the various districts, get the beekeepers together, giving them a discourse upon modern beekeeping, showing them a movable frame hive and explain in detail the mode of working, and the advantages to be gained therefrom. As it is always best to weld the iron while it is hot, an association should be formed at once and names enlisted for the support of the bee journal. Trusting that you will give these few remarks your due consideration, I remain, &c. H. NAVEAU.

News and Reports from Colonial Apiaries.

UNDER this heading we propose to give each month such news and reports from beekeepers in the Australian Colonies, New Zealand, and neighboring islands, as we may be able to obtain, and to this end we now invite all our readers to send us accounts of their apiaries, numbers of stocks, breed of bees, the style of management, form of hives, reports of the passing seasons, general success or otherwise. Also any news about the local markets for honey, or any apicultural information from their neighborhood.

DEW DROP APIARY, MARONG, VICTORIA.—Commenced last season with six hives of bees; increased to fifteen, and have taken a little over 1000 of extracted honey. It was a short season here, the honey flowing from about the middle of December to the end of January, when it suddenly ceased flowing. It flowed for a short time during March, and this flow gave us a little surplus honey and put the bees in good condition for wintering.

J. B. GREENWAY.

[We thank Mr. Greenway for so promptly responding to our circular. Will he add to his favor by telling us of the chief source of the honey in his locality?—Ed.]

ITALIAN BEE FARM, PARRAMATTA, N.S.W.

SEASON 1886-7.

MAY is the closing month of the season for bee-farming in the most parts of Australia. Last season was extraordinarily wet, and in consequence of this our honey yield was not up to the quantity of last year's (1885-6) harvest. The number of swarms was also small, but sufficient for our purpose, as we

wanted no increase of stocks, our normal number being 250 colonies. The beginning of the season did not differ from former years and the bees bred as well as could be expected, but the orange-blossoms flowered only a short time and in less quantity than the previous year, so that, although the bees had stored a good deal of honey, it was thought best to leave it in the hives as they were breeding fast and required a lot for feeding the brood, the more so, should no honey-producing flowers follow. And so it was, November and December offered hardly any nectar-yielding flowers, and the stores were just sufficient until January for the greatly decreased brood and the bees themselves. Many colonies, not being under good care, perished, and others had to feed their bees, so I have been told. That was discouraging for many, especially for the beginner. The frequent and continuing rains in the height of the season brought about a vegetation most remarkable, and the Eucalyptus, instead of flowering as would have been the case in a dry season, sent forth long young branches, the benefit of which we shall most likely reap next year. In January and February trees in the bush came in flower, and brought new life and activity in the hives. An immense increase in brood was perceivable, and the strongest hives swarmed at the end of January and in February. All swarms were exceedingly strong, and they built their new brood chamber with beautiful comb in a short time, a proof that honey was now coming in freely. At the beginning of March every hive was crowded with bees, but not a pound of honey had been taken so far. I looked forward with great anxiety, and hope, as March has always proved to be the best honey-yielding month. This hope has been fulfilled to a great extent. Although it was often raining, and only half the time suitable for honey-gathering, the little bees were busy to the utmost and filled every cell with honey. Extracting went on every day, whether rainy or fine, to give room for work. A three-days' heavy rain at the beginning of April brought this great honey-flow to an end. After taking all surplus honey the preparation for wintering was finished at the middle of May, the number being again 240 colonies. Our honey-yield for the short time of gathering is 7000 lbs., most of very good quality, and about 1000 lbs. is comb-honey. Nearly all our product is sold already. As there is every prospect of an excellent honey season next year our little workers will repay us with interest for all care and attention bestowed on them. It was remarkable that last season no parrots happened to visit our district, while in former years, especially in good honey seasons, they would be seen in swarms. Did they know that but little food was to be found here for them?

W. ABRAM, Manager,

Italian Bee Company, Parramatta, N.S.W.

Extracts from Foreign Journals.

OUTLINES OF BEEKEEPING FOR BEGINNERS.

From British Bee-keepers' Journal.

IV.—HOW TO MANAGE AND CONTROL BEES.

1. The honey-bee has become a domesticated animal; it accepts the dwelling which we select for it, and takes the food we provide it with; becomes used to the care and attention we bestow, but does not learn to know its master, and if he disturbs its dwelling or interferes with its flight, will sting him just as readily as it will a stranger. It goes its own way, interferes with no one, and will not allow anyone to interfere with it. Fright and fear are the means by which bees may be controlled. The Eastern races are an exception, but as they are not suitable for beginners, we shall not refer to them.

2. Many bees are very quiet, and with gentle handling much can be done with them; more especially is this the case with pure Carniolan and Italian bees. Others are not so manageable and we have to resort to other means. Smoke or carbolic acid frightens bees and they immediately rush to the cells to fill themselves with sweets.

3. Before examining a hive, blow a little smoke in among the bees. Whatever has to be done should be performed as rapidly as possible, and if any operation takes a long time it will be necessary to give more smoke. Quiet manipulation will generally prevent bees becoming angry, but should they show their tempers, they can be subdued by giving them from time to time more smoke.

4. For this purpose a smoker should be used. Brown paper, rags, old fustian or sack- ing rolled up, lighted and put into the barrel with the smouldering end downwards, will answer the purpose for supplying smoke, and will keep alight for a considerable time. Care must be taken not to give too much so as to stupify the bees.

5. If carbolic acid be used the treatment must be different. A solution is made by mixing four tablespoonsful of No. 5 Calvert's carbolic acid in one quart of warm water, shaking it up well. With a goosequill apply some of the solution to the alighting board and around the entrance, as well as a little within. If a skep is to be examined, turn it up carefully and spread over it for a few seconds a piece of thin calico moistened slightly with the solution, when, on its removal, it will be found that the bees have run down amongst the combs. For moveable comb hives raise the quilt slightly at one end of the hive, and apply the feather dipped in the solution along the tops of the frames, or the calico may be spread over them the same as described for a skep.

6. As carbolic acid is a poison, great care is required in its use, and should any of the solution come into contact with the hands, they should be immediately rinsed in clean water. Should there be any cuts or cracks on the skin still greater care must be taken.

7. During great heat, causing much perspiration, and in very windy weather, when the bees are blown about and the smoke driven away, they should be left alone.

8. Bees do not like bad smells; dust or dirt and dark colors irritate them. Human breath is also offensive to them. Persons dressed in dark clothes and having dark hair, are more liable to attack than those having light hair and wearing light-colored garments.

9. Beginners who have not yet got used to stings should provide themselves with a veil to protect the face. This can be made of coarse black net, one yard by eighteen inches. Fasten the ends together, run a hem round the top, insert an elastic, and draw it up until it fits round the crown of a hat. The rim of the hat keeps the veil from the face, and the lower end can be tucked under the coat about the neck.

driven forth by the workers. In queenless hives they remain sometimes until the following spring.

4. Sometimes what are known as fertile workers are found in queenless colonies—no longer having the requisite means of producing a queen, but from the eggs they lay only drones proceed.

(To be continued.)

A RETROSPECT OF BRITISH APICULTURE.

From British Bee Journal, 6th January, 1887.

WE have passed the threshold of another year, but before we commence the activities and duties of that on which we have entered, it is desirable to cast a retrospective glance on the progress of apiculture during the year 1886.

In looking back, then, on the year that has just passed, our mind is chiefly attracted to the numerous Shows which have been held in various parts of the United Kingdom.

We are pleased to be able to note these visible indications of the growing interest taken in apiculture by agricultural and horticultural societies, and by the public generally. Wherever a meeting of a society for the promotion of agriculture, horticulture, or floriculture is now held, the beekeepers are invited to take their part in adding an attraction, and in giving a zest to the Show. The claim of apiculture to be allied to agriculture is now generally recognised. This has been notably the case during the past year. The bee department at the Royal Agricultural Show, held at Norwich, was no unimportant auxiliary to the attractions of that exhibition. The visit to the department by their Royal Highnesses the Prince and Princess of Wales, their daughters, and suite, will cause it to be borne in remembrance by beekeepers. On that occasion the number of exhibitors was very large, and the exhibits were of a very diversified character, and the most improved methods of bee-culture were brought before the notice of British agriculturists in a very practical form. Again, when the Royal Horticultural Society renewed its provincial Shows by holding one at Liverpool, the Council of the British Beekeepers' Association rendered material assistance towards the arrangement of a department for bees, hives, honey, &c. The Royal Counties' Society, which had held its meeting in 1885 at Southampton, this year held it on Southsea Common, on which occasion it was accompanied by that enterprising Association, the Hunts and Isle of Wight B.K.A.; and as this was the first occasion when a Bee Show had been held in Southsea, this Association made the best of the opportunity thus presented. The meeting of the Lincolnshire Agricultural Society, held at Lincoln, was also an oppor-

V.—THE DIFFERENT BEES FOUND IN A COLONY.

1. The bee is a sociable insect, and cannot live long by itself. Many bees live together and form a society called a colony. In the colony is found one large bee which may be recognised by her form, size and color, being longer and of more slender structure, with comparatively shorter wings than the others. This is the queen; she is the only fully developed female who lays all the eggs, and is the mother of all the bees in the colony. She passes through various changes from the time the egg is laid to leaving the cell as a full-grown insect in from fifteen to seventeen days, and can live five years, although she usually serves the beekeeper only for two or three years.

2. The other bees are the workers; upon them devolves all the work of collecting and defending their stores, building comb and feeding and protecting the brood. They are females, but are undeveloped as far as regards their reproductive organs. They mature in about twenty-one days from the day the egg is laid, and fly out for collecting in from eight to fourteen days. Those hatched in the autumn generally live through the winter, but during the summer when they have much work to do, they usually live from six to eight weeks.

3. During the swarming season there appear male bees. These are called drones, and are recognised by the noise they make when flying. They are more bulky than the queens and larger than the workers; have no stings and do no work. At the end of the swarming season, when their services for impregnating the queen are no longer needed, they are

tunity which the Lincolnshire B.K.A. took advantage of, much to the promotion of beekeeping in that district.

But the great and outstanding event of the year has been the South Kensington Exhibition. Never before has there been made so effective and complete a display of the products and appliances connected with beekeeping. To be fully realised it was necessary that it should have been witnessed. It was held in one of the finest buildings of the United Kingdom—in the large and commodious conservatory adjoining the Albert Hall. No less than 290 exhibitors sent contributions to the Exhibition, and the amount of honey was calculated to be nearly twenty tons. The honey was of a superior quality, and it was exhibited in a most attractive form. There was a great rivalry among the competing Counties for precedence. The premier prize was awarded to the Lancashire and Cheshire B.K.A. Conferences were held on the occasion, when important papers were read by several leading beekeepers. After an interval of five weeks the delegates from Canada exhibited their honey at the Exhibition. This exhibit consisted of about eighteen tons of honey; but the flavor of the honey was, by the best judges, considered to be not comparable to that of the United Kingdom. The opportunity of practising fraternal courtesies and amenities towards the Canadian beekeepers, was not neglected; and many pleasant and instructive meetings were arranged, in which the mutual methods of conducting beekeeping in Canada and Great Britain were earnestly discussed. The banquet, which was held in South Kensington Exhibition, and the Conversational Meeting in the evening, are amongst the most pleasant reminiscences of our retrospect.

The visit of the Canadians will be long held in remembrance as a chief feature of the year 1886.

There has been a considerable development of the work of the B.B.K.A. in the Counties. Dr. Walker was specially deputed to visit South Wales with a bee tent.

In Glamorganshire the cause was much advanced. Thence he proceeded to Cardiganshire and Montgomeryshire. A lecturing tour was also conducted by Mr. W. B. Webster, who delivered lectures in the principal cities and villages in North Wales. Considerable progress has been made in Northumberland; and as the Royal Agricultural Society will hold its next annual meeting in July at Newcastle, it is expected that the work already begun there will be consolidated and completed. The Association representing the counties of Lancashire and Cheshire has made considerable progress this year. By the presence of its representatives at the Liverpool and South Kensington Exhibitions, and by their regular attendance at the quarterly meetings of the B.B.K.A., the northern

counties have been brought well in touch with the central society. Ireland, too, has progressed considerably during the year. Although not largely represented at the South Kensington Exhibition it held its own, and secured a large share of the honors bestowed in proportion to the number of exhibits sent in for competition.

The future of beekeeping in the United Kingdom materially depends on the loyalty of the affiliated associations and the support they are prepared to render to the central society. There is yet much fallow ground to be broken up, and the work before the parent society is as arduous as it is important. May all beekeepers give cheerful and ready assistance in promoting the progress of the work which yet remains to be done.

In literature we may point to the large circulation *Modern Beekeeping*, issued under the auspices of the British Beekeepers' Association, has attained.

A new edition, bringing the work up to the present times, consisting of 10,000 copies, has been issued. We may say, without fear of contradiction, that the circulation of this work is unprecedented in the annals of bee literature, being far in advance of any work of a similar kind.

Mr. Cowan's Guide Book has also met with much success during the year. It has now reached its eighth edition, and the number of copies issued has been 15,000. The work has already been translated into the Swedish and French languages, and arrangements are now being made for its being translated into Danish, Russian and Spanish. Mr. Cowan has also sent forth a pamphlet on *Doubling and Storifying*, which will prove of great service to beekeepers desirous of increasing their produce of honey.

A cheap edition of the Rev. F. G. Jenyn's work on *Beekeeping for the Young* has been published. The first volume of Mr. Cheshire's work is completed, and the second is being continued in monthly parts.

By the aid of the various shows, and the action of the Honey Companies, the sale of honey has been much popularised, and a great impulse has been given to its sale during the year. Already, we hear that the wholesale buyers are unable to purchase sufficient sections to meet the demands made upon them.

This is promising news for the cultivators of honey, and emphasises the advice we have frequently given to beekeepers, namely, not to place before the public, immediately after the honey season, the whole of the produce of their apiaries, but to keep it in reserve till they are warranted in asking and obtaining a higher price for their honey.

We hope the attention of beekeepers will, in the expectation of increasing amounts of honey being produced, direct their attention to the discovery of further utilities of honey in the way of beverages, comestibles, &c.

During the year considerable attention has been paid to the introduction of new races of bees; from Cyprus, Carniola, the Holy Land, South Africa, America, &c., there have been considerably importations.

These attempts to introduce bees of superior powers, have found much encouragement amongst our leading beekeepers, but the English black bee still continues to hold its place in the estimation of the great body of beekeepers.

The imports of honey for the year are not yet complete; we hope, however, in the course of the present month to have full statistics before us, when we propose to take the opportunity of dealing with both the honey imports for 1886, and the wax imports and exports for 1885.

Notwithstanding the grand display of honey at the South Kensington Exhibition, the season of 1886 cannot be pronounced to have been a prosperous one. In some localities it has been favorable, but the yield in the United Kingdom generally has not reached the average of previous honey years.

Hope, however, ever dwells in the hearts of beekeepers, and we trust, with enlarged experience, and with improved appliances, their best and brightest hopes for 1887 may be fully realised. G. H.

FLOWERS FOR BEES.

From British Bee Journal, Jan. 1887.

We have received a beautifully illustrated annual from Messrs. Webb & Sons, which they style Webb's Spring Catalogue of Vegetable and Flower Seeds, and in which they give a short but useful essay on "Flowers for Bees." We quote the following as of considerable importance and interest:—"Wherever fruit trees are grown in quantity, either out of doors or under glass, no better assistants in ensuring fertilisation can be obtained than the bees, and some of the most successful market fruit growers attribute the regularity of their crops to the industrious aid of these insects. Most of our hardy fruit trees, however, flower in early spring, and there is a long period during which the bees have to seek their honey and pollen supplies in other directions. To assist in this we have prepared the following list of plants that are most serviceable for the purpose, and which are most frequented by the bees. The object is to obtain as long a succession of bloom as possible, and this can be effected with most annuals, or biennials, by sowing batches of seed at different times, so that plants are had in all stages. Have a good quantity of whatever plants are employed, as patches are not of much use, and will be scarcely sufficient to keep the bees at home, and it should be remembered that if this can be accomplished much time will be saved in the filling of supers, a quick return in honey amply compensating

for expenditure in the purchase of seeds. Four plants that should be grown extensively are *Limnanthes Douglasi*, *mignonette*, *borago*, and the *corn-flower* (*Centaurea cyanus*). As much ground as possible should be devoted to these. Sweet scabious is a plant for summer flowering, and does particularly well on banks or mounds. Sweet alyssum and the white arabis also merit a portion of the ground, and will repay for the space occupied. Wall-flowers are almost indispensable in early spring, and cannot be too freely employed. The phacelia is a capital plant for a later period, as also are candytuft, stocks, and sweet peas. Suitable additions to this list will be found in the following annuals:—*Ambrosia Mexicana*, *calliopsis bicolor*, *cerinthe major*, *Clarkia pulchella*, *colinsia bicolor*, *collomia coccinea*, *gillia tricolor*, *luteosiphon densiflorus*, *lupins*, *nasturtium*, *phlox Drummondii*, and *whitlavia grandiflora*. Shrubs like the *berberis*, *lilac*, and *ribes*, are useful, and among trees the *lime* and *sycamore* are perhaps the best. All the *sunflower* tribes are favorites with the bees, also *thyme*, and most herbs may be added with advantage." It is a pleasing circumstance that one of our largest and most successful firms of seed-growers acknowledges the growing importance of apiculture, as Messrs. Webb do by stating that:—"The number of amateur aparians has increased greatly in the past few years, for apart from the bountiful stores of honey so easily obtained under the modern system of management, it is now generally recognised that bees perform a most important work in the garden. We may here mention that Mr. Cowan informs us that he has grown *Echinops spherecephalus* for eight or ten years, and classes it high as a bee plant." Many of our readers, no doubt, are well acquainted with *Echinops Ritro*, an ornamental perennial border plant, which bears a blue flower, and of which bees are very fond

HYBRIDS v. PURE ITALIANS.

American Apiculturist, March 1887.

FRIEND A. L. Taylor, of Lapeer, Mich., has an article in the December number of the *Api* "Italians v. Hybrids," in which he points out the superiority of "Hybrids" over "Italian" bees. Well, first, here is where his experience and mine widely differ. The very point that he makes for his German hybrid bees against the Italians are those most applicable to the pure Italians for this locality. I notice that most all our northern beekeepers, in recording their experience in the trial of this and that, is exactly the opposite of the same experiment tried here in the south, and I have often noticed this from our best writers, those best posted in apicultural knowledge and practical apiarists. Consequently when I see anything so very different in its nature from the same practical results as obtained here at the south, I can

but conclude it is due to the difference in our climate. The conclusion is thus forced upon me that such rules and conditions, as are applicable to beekeeping in the north and west will but poorly apply to the southern beekeeping. This one fact should be kept in view always, when a southern beekeeper is reading after a northern or western apiarist, and *vice versa*, especially when he reads that which is so contrary to his own observation on the same points. That Mr. Taylor's observations between Italians and Hybrids for Michigan is correct, I must think, because I have every reason which he could give, and my knowledge of the man leads me to that conclusion; and further I know that he has for the past two years purchased of me what Hybrid Queens I happened to have on hand in the spring, though he has never been the man to order an Italian Queen of me. As to the relative points of value between bees here in the south, there never has been any bee that is superior to the American (Albino) Italians. Yes, American! Why not American Italians? Certainly there is a great improvement made in the markings of the Queens, Drones, and Workers, in any strain of pure Italians that have been bred up here on our American continent for ten or twenty years to the exclusion of imported stock, that they are in no way Italian except from the fact that the bee was originally from Italy (!) any more so than many of the American people to-day, who all, as a rule, originated from some other country, but are to-day Americans; and why would not the same rule apply to bees, friend Taylor? More especially since in every way, except their originality, the true American Italian is foreign to the imported Italian stock; in this I can agree with Mr. Alley.

Take the black bees in the south, and the first thing they do is to fill up every nook and corner of brood-hive with brood and honey, and then swarm, many times without so much as entering the sections. Then again they fill them one fifth or one fourth, sometimes less, and then swarm; the result is all bees and no comb honey. And this disposition is most prominent in the Germans and Italians crossed, as applied here. With pure Italians they at once enter the sections and go to work and fill them, removing, in many instances, all the honey from the brood chambers, excepting a little at each end of frames, and have brood right to the top bar of frame. I never had a hive of pure Italians swarm till after the surplus department was filled; that is their strong point here, which is more than I can say for any other strain or race of bees, and I have kept during the past four years, Cyprians, Syrians, Carniolans Italians, and Albino Italians. The same remarks that apply to Italians are applicable to golden or Albino Italians; their most striking difference being in their markings.

Queries and Replies.

QUESTIONS.

Question 4.—What is the best food to give to bees when they have got no honey in the combs in winter time, and what is the best way to give it to them? Some of my bees are dying, and the boxes are very light. I don't think they have got any honey inside.

J. SIMPSON, Otway.

Question 5.—Mr. Editor,—Please inform me what is the botanical name of the tree that bears a bright red flower, very much like the blossom of the honeysuckle, and like a bottle brush. It comes out early in summer, and I saw hundreds of bees on them last season. Do they come from seeds or cuttings?

WATERLOO.

Question 6.—I have a frame hive, and I want to move the bees out of a box into it. Is it safe to transfer them now, or is it better to wait till later?

QUEEN BEE, Loddon.

REPLIES.

Reply 1.—The question of how to prevent bees fastening down the bottoms of frames and sections to the tops of the frames beneath by brace combs, &c., is a difficult one. Numerous plans have been suggested and numerous devices tried, more or less but not completely successful. The perforated zinc honey-board appears to be the most certain preventative. Honey-boards made with narrow slats, with a bare bee space between each slat, and so placed that the spaces are exactly over the centre of each frame in the brood chamber beneath is also well spoken of, but are useless if not used with the strictest regard to the exact position described. The trouble is often much reduced by a careful adjustment of the space left between the tops of the frames and bottoms of sections, or slats of honey-board, this space should be just about $\frac{1}{4}$ inch. We intend devoting an article to this question in our next number.—Ed.

Reply 2.—Yes. Any piece of comb containing honey can be cleared in the extractor by use of a little arrangement called an extractor basket. It is simply two pieces of wire net ($\frac{1}{4}$ or $\frac{3}{8}$ mesh) hinged together so as to hold the comb, and thus held it is placed in the extractor frame and cleared in the usual way.—Ed.

Reply 3.—We will endeavor to comply with J. S.'s request in our next.

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JOURNAL

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JOURNAL.

VOL. II.—No. 3.]

AUGUST 10, 1887.

[PRICE 6D.]

Editorial.

HINTS FOR THE SEASON AND QUEEN INTRODUCTION.

BEES are already preparing for the new season, and strong stocks have now some brood in their combs; it is to be hoped all our beekeepers are equally ready. The whole country has recently had such a thorough soaking it has not enjoyed for many years past, and if our spring be at all mild and propitious, vegetation will be luxurious in the extreme, producing a glorious time for the bees.

So soon as the early wattles and other flowers come in bloom, our friends will require attention, and if their space has been contracted during the winter, they must be given more room in good time, by adding frames of comb if possible, if not frames of foundation. It will be well to see that no stocks are queenless before the first harvest comes, so that a new queen can be supplied in good time if they are found so. This brings us to the question of queen introduction, concerning which much has been written lately, and many modes of introducing advocated. Every experienced beekeeper has his own way, all more or less successful in their own hands. Some use cages of one kind or another in which the queen is placed in the hive among the strange bees, and kept prisoner for a period varying from 12 to 48 hours before releasing her among her new subjects, while others introduce her directly without imprisonment or any delay. Last season we tried Simmin's direct introduction without a failure. It was done this way in every case:—During the day the old queen was removed from the hive, and in the evening the new queen was placed under a cage, without food or any companion bees, for just about 30 minutes, when she was taken to the hive, and after gently lifting the cover and one edge of the unit near the cluster, without

disturbing the bees, she was allowed to run in. The hive was immediately closed, without any jarring or noise to disturb the bees, and left for a couple of days, after which we took a peep to see if she was all right, and in every case was the introduction successful.

The greater majority of our queens, and all the virgin ones, were introduced in a modification of Alley's Combination Cage, and last season we had one of these cages in almost every hive, permanently fixed in an upper corner of one of the frames. These cages are made thus:—Pieces of $\frac{7}{8}$ pine or clear lumber, just 2 $\frac{1}{2}$ inches wide and any convenient length, are marked out in 3-inch lengths. Run a gauge line down 1 $\frac{1}{2}$ inch from one edge the whole length; now measure with a pair of compasses 1 $\frac{1}{2}$ inch from the end of each 3-inch length on this gauge line, and mark the points; with the centre on these points bore 1 $\frac{1}{2}$ -inch holes cleanly through the board. Next run a gauge line right along the centre of same edge of the board, and square the lengths over this edge. With a pair of compasses mark off on this gauge line points 1 $\frac{1}{2}$ inch from the same end of each length that the centre of the hole was gauged from—this will be the centre of a $\frac{3}{4}$ -inch hole to be bored into the 1 $\frac{1}{2}$ -inch cage hole, and is used for inserting the queen into the cage. Now, from the other end of each length, and on the same gauge line, measure off $\frac{3}{8}$; this will be the centre of a $\frac{3}{4}$ -inch hole, which must be bored nearly to the bottom edge of the board. Now we have our board marked off into 3-inch lengths, with a 1 $\frac{1}{2}$ -inch hole through the flat and two holes in the top edge of each length, one opening into the 1 $\frac{1}{2}$ -inch hole and the other clear of it. Now, with a fine tenon saw, cut out the 3-inch lengths nice and square, as marked. The $\frac{3}{4}$ -inch hole, nearly the whole depth of the block, is for the insertion of food for the queen, but so far there is no means for her to reach it from the cage chamber when it is closed. To make it

accessible we bore $\frac{3}{4}$ -inch holes into the ends of the blocks so that they pass through the feed hole into the cage chamber. Plug this hole up outside the feed hole to prevent the queen or bees escaping that way when the food is used up. The next step is to tack wire net on each side of the block to enclose the cage chamber. The cage is now complete, but they can be improved by dipping the feed-hole end of each block into very hot melted wax, which will prevent the cages getting saturated with the food put in the feed hole and getting sticky. To use this cage for introducing a queen we first half fill the feed hole with food made by mixing together *finely floured sugar* and honey until it is a very stiff dough, and insert the queen with a few of her own bees, or else some young bees just hatched from any hive, or even alone, and place the cage in any convenient corner of one of the frames so that the bees can get on to the wire net of the cage, and can also get at the food, which they quickly clear out and release the queen in an hour or two. Our method of having a cage fixed in one of the frames of each hive is very convenient, for we have only to put in the food and the queen and put a cork in the cage hole to confine her till the bees release her. The cage is also useful to keep spare queens in, or even to hatch a queen cell in. It can be used so easily, without any disturbance of the bees, and supplies the best method we know of for queen introduction. In fixing the cages in one of the upper corners of the frames, two holes must be cut in the top bar of the frame to correspond to the queen entrance and feed hole in the block. These can be kept covered by a strip of tin or zinc when in use, and with slipping the tin so as to expose the feed hole while covering the cage entrance, we can dispense with corking the opening; indeed, this plan is necessary in the case of using the cage for a queen cell, as the cell has to be suspended in the entrance hole.

HINTS FOR SEPTEMBER.

HEALTHY colonies will now rapidly increase and require watching, so that room may be given in good time to prevent their being overcrowded, and yet not so soon as to induce them to spread too much, for we must remember we often get excessively cold nights and very bleak days in September. Keep them so close that they fill all the frames pretty thickly and *boil up* on the tops when the mat is lifted a bit.

If fine weather and a good spring of blossoms occurs early in the month, and a cold streak supervenes, it would be wise to feed slowly till fine weather comes again, as it keeps the bees happy and prevents a check on breeding; for very much of the season's success depends on keeping the bees rapidly increasing their numbers this month.

Have everything ready for swarming,

which may commence any time after the middle of September in our warmer localities. As soon as the honey flow fairly sets in, watch for the right time of supering with sections or extracting frames; this should be done immediately the bees are found widening out the combs at the tops of the frames. We had great success last season in putting in every super, or crate, one row of sections full of comb from preceding season (one or two with a little honey), or in the case of frames for extracting two or three full of last year's comb. The bees take to the work in the supers at once if the weather is good and honey flow continues. Now is the time to build up any stock from which to obtain an early lot of queens, and this is best done by slow but steady feeding and keeping the colony warm, contracting the entrance somewhat and putting on an extra mat.

That beekeepers' pest, "foul brood," is abroad, and every one should be on the *qui vive* for its appearance. If any is found now it is almost sure to get worse as the season advances, and it will be necessary to adopt some measures to stay its progress. Any of the methods recommended in former numbers may be tried, they all seem to succeed sometimes; no curative methods, however, have been successful in our hands. Placing the bees in a new hive with starters of foundation only, and feeding with phenolated or salicylated food are the only plans that we have succeeded with. If, however, the disease is really bad and affecting nearly all the brood, the stock dwindling and the unpleasant odour very perceptible, utter destruction is the safest cure.

It will be best for beekeepers now to decide what policy they will adopt as regards swarms; if they desire increase of stocks, encourage early swarms by crowding and warmth, and taking the usual precautions against second swarms if desired. More than two swarms from the same colony is scarcely to be desired, except two or three months later.

If honey produce rather than more stocks of bees is required, only one swarm should be allowed to come off, and that should be returned in this way:—When the swarm is off move the hive away a little and put a new one in its place. Take four frames of brood from the old hive with any bees that may be on them and place in new hive. See that all frames with queen cells are left in old hive, or cut out cells that are on frames put in the new one. Put in four frames with foundations (starters or full frames) and fill hive with dummies. Hive the swarm in this new hive, which is now on the old stand, and if there was any super with sections or frames over the old hive, place it on the new, and work will continue almost as well as if no swarming had taken place. Remove the old hive to another stand, and the remaining bees and those rapidly hatching out will attend to

the queen cells and rear a queen, and, together, will form a strong nucleus which can be rapidly built up into a new colony and, probably, store a good autumn surplus. This is far better than having the stock divided into two weak portions, neither in a position to store surplus honey while the first harvest is on.

Original Contributions.

FIXING FOUNDATION IN WIRED FRAMES BY MEANS OF A GALVANIC BATTERY.

SINCE describing the method I have adopted for fixing foundation in wired frames by electricity, at a meeting of the Victorian Beekeepers' Association last year, I have received numerous letters on the subject and many enquiries; I have also been gratified to hear of its successful adoption by many beekeepers, who have surmounted the little preliminary difficulties, and who express their appreciation of the ultimate simplicity and perfect success of the method; I have also heard of many who have not succeeded, on account of not knowing the kind of battery necessary, nor the exact mode of manipulation. At the Beekeepers' Association I shewed the members present the whole process, but the description given in the report of the meeting in the *Australian Beekeepers' Journal* was, perhaps, not sufficiently detailed to enable those not present at that meeting to clearly understand it. I, therefore, give the following detailed description of the method I adopt:—
1st. I use a carbon and zinc galvanic cell, excited by bichromate of potash solution. The carbon and zinc elements can easily be obtained wherever telegraph materials are sold, the plates, both carbon and zinc, should have at least 20 to 25 square inches surface; that is, they should be 7 x 3 or 8 x 4 or any such dimensions. If, however, only smaller plates can be got, a double set should be obtained. It will be best to obtain the plates and cell already made up unless one understands the construction of a galvanic battery; they cost in Melbourne from 6s. to 10s. according to size. The cells or jars should be of glass or hard earthenware, and should be as large as convenient; at least a quart for the fixed plates given above. The larger the vessel, the larger the quantity of exciting fluid, and the longer the battery will work without new fluid.

The fluid is made thus:—For a quart of fluid, use 3½ ozs. of bichromate of potash, which can be got at any druggist's (the wholesale price is 6d. per lb.). Put the bichromate into a stone jar and pour the requisite quantity of hot water on it and stir till it is dissolved. This fluid will keep any time. Before using for the battery, add to every ten measures of the solution one measure of

sulphuric acid (oil of vitriol); that is, if ten or eleven teacups full of battery fluid is required to fill the cell, measure out ten teacups of the bichromate solution, and one teacup of sulphuric acid and stir them together. Bear in mind that sulphuric acid is very corrosive and burns the skin and destroys any clothing it comes in contact with, and also remember that the battery fluid is also damaging to clothes, for any splash or drop getting on linen, calico, or woollen stuff, produces a hole in a few days. Now, if the zinc and carbon elements are placed in the fluid so that about two-thirds or three-fourths their length is immersed, the galvanic current will be produced. Care must be taken that the plates are not immersed too deep or the connecting parts of the plates will be corroded and spoilt. Belonging to the zinc plate is a binding screw, and to the two carbon plates another. To each of these screws fix a piece of copper wire about 2 feet in length. Wire covered with cotton, silk, or gutta serena, with the ends laid bare, will be best, and the wires themselves should not be too fine, about No. 18 or No. 20 wire gauge is a good size; these are called *leading wires* or *leads*. If when the plates are immersed we take a leading wire in each hand and rub one quickly across the other, an electric spark will be seen if all is right, and if we stretch a piece of the wire used for frames and place one of the leads on it, and the other about half an inch distant from it, the framing wire will instantly become hot, even red hot, between the two leads, if the battery is in good order. The plates should only be immersed in the exciting fluid when actually required and should be taken out immediately the work is done, for if they are in the fluid long the strength of current diminishes greatly, but improves if the plates are taken out for a while and again immersed. The fact is the fluid gets weaker around about the plates very rapidly, but by removing and then replacing them the fluid gets mixed again and and hydrogen gas which collects on the plates and weakens their action is released and the battery works with fresh vigor when the plates are put in again.

A pint or a quart of fluid will only do so much work, and, as it is running down or exhausting itself all the time the plates are in, whether you are using the current or not, it is economising to keep the plates out except during the actual time the current is required. A good way is to have two similar jars, one with the fluid and the other with clear water, and, as you take the plates from the fluid, place them in the water. By taking the precautions indicated here the battery and fluid will last a long time. The zines gradually wear away, but the carbons are everlasting, so that the zines have to be renewed from time to time. When the fluid is exhausted there will be only a feeble current

produced for a very short interval, and the fluid will have become a dark olive green color. New fluid should then be used; indeed, it is economy never to try to work with a weak used-up fluid.

Now, about using the battery. The frames being wired, the foundation is laid on a board just the size of the inside of the frame, made so that in laying the frame over the board and foundation, the bottom bar, which is usually curved with wiring, shall be straightened out, and the wires stretch straight across the foundation. Now take one of the leading wires in your left hand and touch firmly one of the frame wires, close to the bottom of the frame, with the other lead in the right hand, touch firmly the other end of the same frame wire, and if the battery is good the whole length of wire gets warm and melts its way into the foundation to the base of the cells. If the battery is not strong enough to do this except very slowly, halve the distance; that is, make two steps of it, your left hand lead close to bottom bar, the other in middle of wire, and it will probably do it instantaneously; next shift your left hand lead to the middle and your right close to top bar, and so on. I frequently find it quickest to make two, three, or even four steps across a wire according to the state of my battery; it is done as quick as you can touch the wire almost. Two precautions are necessary; keep the touching parts of your leads clean, or wax may stop the current. 2nd. Lift your left hand lead before the right, or the warm wire may spring out of the foundation again. A little practice and a good battery makes quick work of it, quicker and far more certain than any other method, not excepting the new "Woblet spur" method, which I have tried and cast aside as not comparable to the battery method.

Of course, any form of battery can be used if it has sufficient current; a small dynamo machine, where there is a great deal of work to do and there is motive power in the apiary works, would be the best of all. Perhaps, also, in a large apiary a set of three or four large Daniels' cells, joined up for quantity current (which once set going require little attention), would be the most advantageous source of the electric current, but the plan I adopt is perhaps the most convenient for a small apiary, and even for a large one, until the superiority of the method has been clearly proved.

Where bichromate batteries of smaller size only can be obtained, couple them together in this manner—with copper wire like the leading wires, join the binding screws of one zinc with the zincs of the other cells; join also the carbons in the same way and take your leading wires from any carbon and any zinc in the set. By doing this you make all the zincs into one large plate, and all the carbons too, and, together, it is equal to a battery with plates equal in surface to the sums of the surfaces of the small ones. Any number of

small cells may be thus combined into one large cell; for it must be remembered it is a large quantity of electricity is wanted to heat the wires, and this is better got from one large surface cell than from several cells joined in series together. The mode of joining up, given above, is called joining up for quantity, and really combines any number of cells into one large one. R. L. J. ELLERY.

News and Reports from Colonial Apiaries.

THE FAIRFIELD APIARY.

HAVING read with interest the descriptions of several Apiaries given in your Journal, I send you the following of a South Australian Apiary, thinking that it may be interesting to many of your readers. I believe the Fairfield Apiary to be the largest in South Australia, it is the property of Messrs. Coleman and May, and is situated at Mount Barker, about 25 miles south-east of Adelaide. The township of Mount Barker is one of the prettiest in Australia, being situated in park-like, undulating country, with mile after mile of hedgerow, while clumps of large gum, and other trees relieve the landscape, the mount itself rising from the outskirts and overlooking the township. The Fairfield estate is about 1½ miles from the township, the bulk of it being in meadow land, well sheltered with trees, amongst others are some fine oaks and willows, over forty years of age, some of the former having a spread of about sixty feet. There is also an extensive garden and orchards, a large English-looking house, and the usual farm buildings, whilst the whole of the general surroundings betoken taste and refinement. But it is with the Apiary that we have to deal, a distant view of which can be obtained before the entrance gates are reached; it is situated in the garden near the house, on a hill facing the north-east. The long rows of white hives, placed at regular intervals, in curved lines round the hill-slope, seen at the distance of which I am speaking, look more like the upright grave-stones seen in some English cemetery, than anything else I am acquainted with.

In the foreground two glistening objects may be seen which turn out to be solar wax extractors. In the rear of the hives is a sweet-briar hedge about ten feet high, behind this may be seen the tops of the pines and other trees which form an avenue leading to the house.

About the centre of the rows of hives, and against the hedge, is a neat weatherboard building, this is the extracting house.

I believe that the present family were the first beekeepers in the neighborhood, having imported their first swarm of bees from Sydney some thirty years ago, but it is only about three years since they began to go exten-

sively into the business, when they commenced with twenty-seven stocks.

The hives used are of the Langstroth pattern which have been imported from New Zealand, some modifications being made to order; porches being provided, and the entrances enlarged to eight or nine inches. The present number of stocks is about two hundred.

The apiary is mainly worked for extracted honey, the hives being gone through about once a week during the honey-flow and even then some hives require a third story. One swarm of Hybrids having gathered over sixty pounds of honey per week, for weeks in succession. The extracting house is a two-roomed weatherboard building about 30 x 12 feet, completely ant and bee proof, windows and doors are fitted with wire cloth screens so that free ventilation can be obtained in hot weather; small doors are provided through which the boxes of frames slide on runners, one box of full frame being lifted off the barrow on which they are carried from the hives, and slid into the house; a box containing frames which have been emptied is taken out, and these frames being returned to their several hives, the box is then ready to be filled again with full frames. Mr. Coleman is thus kept busy outside supplying those inside with frames to extract.

Inside the extracting house Mr. May and a hand are employed, one working a four-frame and the other a two frame extractor. These extractors are fixed one on each side of the small doors through which the boxes of frames slide, between them is the uncapping can, with knife heater attached so that the operators have hardly to move a foot whilst using their extractors.

From the extractors the honey flows through sieves into buckets in which it is carried into the honey-room, at the northern end of the building, where it is emptied into the ripening cisterns; over 12 cwt. has been extracted in one day, and over 2 tons in one week.

The honey-room is about 12 ft. by 10 ft., partitioned off the rest of the building; in it are fourteen ripening cisterns which have a capacity of about $4\frac{1}{2}$ tons; over these are racks for the storage of cases of sections, &c. From these tanks the honey, when properly ripened, is drawn off into the tins or bottles in which it is sold. The packages used are principally 56 lb. tins, 3 lb. tins, 2 lb. tins and bottles, the bulk being tinmed. The tins when filled and weighed, are removed to the outer room where they are soldered down, labelled and packed in cases; piles of cases filled and ready for market are here stored, while many buildings about the place are utilised for the storage of hives, cases &c., every inch of room being apparently made use of. Cleanliness is insisted upon, so that lady visitors can see the whole of the process without any danger of getting their dresses sticky with the honey, even the floors being kept scrubbed. The principal

sources of honey are blue gum, *eucalyptus leucorylon*, flowering from October to December inclusive, and the red gum, *E. rostrata* in January. These are splendid honey-yielding trees, but unfortunately they are only rich in honey every second year.

The manna gum, *E. viminalis*, flowers regularly in March, with a fair quantity of honey, but its quality is often inferior, so it is reserved for feeding purposes and winter stores. From this it will be seen, that in this locality, a very heavy crop is necessary in the good years for it to be a profitable business, and also that it is not all eucalyptus that are to be depended upon for honey. The stringy-bark, *E. obliqua*, is here considered almost worthless for honey, it being so irregular in flowering.

Messrs. Coleman and May make their own comb foundation, and most of their appliances are either of their own make, or are altered by them as may be found necessary.

With regard to Ligurian bees they consider that they are much better honey-gatherers than the blacks, but that the first cross, that is, the progeny of a Ligurian queen, mated with a black drone, is, as far as honey gathering is concerned, about as good (it is a stock of this description that has the best record this year), but they are not so nice to handle.

The blacks make the nicest-looking section honey—but that is about their only recommendation.

From what I can learn, I believe the Fairfield Apiary is one of, if not the most complete apiary in the colonies; if you or any of your correspondents are acquainted with one more complete, I for one, should be much interested in hearing of it, and hope that this brief description that I have been able to send may stimulate you or them to do likewise, as I think we may all gather many useful hints in this way. I am, yours respectfully,

ALFRED SAYER.

GOOD RETURN FROM HYBRIDS.—A bee-keeping friend at Mount Barker, South Australia, says: "the harvest last season was an excellent one in this district. My ten colonies gathered just 2000 lbs., viz., five extracted hives gave average of 280 lbs. each; five comb honey hives, 120 lbs. each. Bees were first cross (Ligurian and black) capital workers."

Correspondence.

No. 43. First number *B.J.* to hand on the 10th inst., dated 10th June; first number new *Australasian B.J.* from New Zealand the day before, dated 1st July, in which see KENDALL'S contribution, as the work for the month column is of no use to amateurs if it is *ante dated* a month, especially at some times of the year.

You are asked in this number, and very

often will be asked, how to make cheap hives, &c. Now I propose to show how it can be done, though I have always found that people having hives, &c., for sale generally sneer and try to stifle any attempts of the kind, though it is the only way to thoroughly popularise bee-keeping in a rational way, and after people have a start in a cheap way and are satisfied, they will want better appliances—so actually creating new customers.

For a foundation, after a lot of experience, I have settled on the kerosene case, as I have found it everywhere in the colonies, and always the same size, from Port Melbourne to Thursday Island, and have adopted it without alterations, for generally, if you ask a man to cut a case he spoils it. It makes a hive almost Langstroth size on Abbot's principle, which is simplicity itself, no rabbets or grooves to bother an amateur, and he does not have to put his fingers amongst the bees to lift a comb, which I have always found a beginner nervous of doing. But, better than all explanations, I will make one complete with cover frames ready waxed and gauge and frame block for making frames square and always one size, and present to your Society if you will agree to exhibit it, and make arrangements to keep it somewhere to refer enquirers to.

I have also perfected an extractor that can be made for 2s out of two kerosene tins, and have extracted hundreds of pounds of honey with same, a pattern one of which I will also make and present if you can make it public, as I am sure it will be extensively copied to the certain advancement of the industry. If this meets your views please drop a line accepting same, and advise when and where to deliver same, and I will start right off to make and deliver same, and remain yours respectfully,

W. WATTS, of Watts Bros.

[Mr. Watts' kind offer has been accepted, and he has forwarded a hive complete which will be exhibited at the next association meeting, when it will be arranged to keep it in some place where it can be inspected by any wishing to do so.—ED.]

No. 44.—As one of the greatest drawbacks to successful beekeeping is *Foul brood* let me inform you about what I have been reading in Gravenhorst's illustrated *Bienenzeitung*. After the disease has been conquered it is of the utmost importance to supply the weak colony with strengthening food. Such a food has been invented by Henning, and is called *Henning's Feed Cake*. It is made as follows:—

Sugar	1814 grammes
Water... ..	360 „
Starch meal	40 „
White of egg	2 „
Phosphate of lime	2 „
Carbonate of lime	2 „
Salicylic acid... ..	2 „

The sugar and water is boiled to the consistence of candy, and the other substances reduced to powder are added by gently stirring. After the whole has been boiling a few minutes longer it is poured out into frames, one side of which has been covered with either waxed or parchment paper. When cold these frames may be hung in the hive alongside the cluster.

H. NAVEAU.

Hamilton, 6th June, 1887.

PREVENTING FIXING TOP OF FRAMES TO SUPERS.

No. 45.—To prevent the bees fixing top and and bottom frames together we find that a piece of Hessian, or stout bran bag, laid on the top of bottom frames, leaving only the two outside frames uncovered, is a certain preventative of this. It breaks the touch of the two working parties, which is the solution required; also, we have never found a queen in a super fitted with it, as the two outside combs usually contain honey and pollen only on their outside faces, the queen very rarely goes on them, and so does not find her way upstairs. The bees bite the Hessian a lot, but it lasts a season, is cheap, and usually on hand; in fact, we always use it as a first quilt to give them notice to go down.

WATTS BROS., Box Hill.

Extracts from Foreign Journals.

COMB HONEY.

[The following essays were written for the *American Apiculturist*, from which journal they have been extracted. Our Australian readers must bear in mind that the summer months in N. America are winter months here, and that the months of May, June, July, August, &c., correspond to the months of October, November, December, January, &c., in Australia.—ED.]

Methods as practised and advised for the production of the largest number of pounds in any season at the lowest cost of labor and time and in the best marketable style.

METHOD NUMBER ONE.

By G. M. DOOLITTLE.

In order to produce good results by way of getting plenty of well filled sections of comb honey, the first requisite is plenty of bees when the honey harvest arrives; for, whatever else we may have, success cannot be obtained without plenty of bees. Then one of the greatest objects looking towards an abundance of bees is a good queen, for without such a queen it would be impossible to get the required force of bees at the time it was positively necessary that we have them if

success is to crown our efforts. These bees must be on hand in time for the honey harvest, else they become merely consumers instead of producers. How often we find people keeping bees on this consuming plan, getting nothing from them in the time of section honey, except perhaps a little fall of honey of inferior quality, for the reason that they do not have anything but colonies weak in bees at the time the harvest of white honey occurs. Such beekeeping does not pay, and if we would succeed, our first step is to get plenty of bees in time for the honey harvest.

White clover is the principal honey-producing plant in most localities, which blooms about 15th June,* and is at its best from 25th to 30th June, hence our bees must be in readiness at that time if we wish to succeed. After years of trial I find that it takes about six weeks to build up an ordinary colony in the spring to where they are ready to get honey to the best advantage, so we should commence active operations about 1st May, where clover produces our white honey crop. There are several ways of working our bees to get the greatest possible number at the right time, the best of which, as I consider them, after years of trial, is the spreading of the brood in connection with chaff packing as given to us by T. H. Townley, 1877.

For this packing some prefer one kind of material and others a different kind, such as sawdust, leaves, the many kinds of chaff and hay. After trying nearly all of them I find that oat-straw is fully equal to anything and less objectionable on account of litter and scarcity. Having the colonies all warmly packed we must reverse the brood at the time pollen becomes plentiful, in all of the good colonies, but leave the poorer ones till later because they might suffer from such a procedure if a cold spell should occur. By reversing the brood, I mean the placing of the combs having but little brood in them at the outside of the brood nest, in the centre, which brings the combs having the most brood in them on the outside. Thus while the colony has no more brood than it had before, the queen finds plenty of empty cells in the centre of the brood nest, in combs having some brood in them, and she at once fills these combs with eggs, so that in a few days they will contain more brood than those which were moved to the outside, while the bees have fed and taken care of this as well as though its position had not been changed. In this way quite a gain is made in regard to increasing the brood.

In about a week, if the weather is favorable, a frame of honey is taken from the outside of the cluster, the cappings to the cells broken, and after separating the brood nest in

the centre the frame of honey thus prepared is placed therein. In removing this honey and carrying it to the outside of the brood nest the bees are made happy, which causes them to feed the queen an extra supply of egg-producing food, so that in a short time this frame is also filled with eggs. In a week or so, as the bees increase in strength, another frame is placed in the centre as before, and so we keep on till every comb in the hive is filled with brood.

In proceeding as above it is essential to know that each colony has sufficient honey to supply all its wants for at least two weeks, for if we wish to obtain the largest amount of brood possible the bees must never feel the necessity of feeding the brood sparingly on account of scanty stores. If plenty of honey in the frames is not at hand, a feeder and some sugar syrup will be a necessity, but I consider the frames of honey preferable for this purpose. Having the hive filled with brood, the next thing to be done is to put on the sections. Of course these are all in readiness, for a successful beekeeper will always work at this getting ready part at odd spells during winter and early spring. After several years of experience and testing of various plans I conclude that it is best to fill the sections with thin foundation, not so much to help the bees as to get nicer looking combs, and those which will stand shipment better. Some think that the bees will not work so well on foundation a few months old as they will on that just made, so defer this getting ready part till at the time wanted. I think the idea a mistaken one, but even if there was some truth in it I still should put the foundation in during winter, believing that the gain would more than overbalance the loss. The best way which I know of (after trying nearly all the plans and fasteners recommended) to fasten this foundation in sections is to take a board of suitable width and length and fasten to it five or six little boards of the right thickness to come half way or to the middle of the sections. Now slip the sections over these little boards and lay the foundation in its place with one edge coming closely to the underside of the top piece to the section. Set the board angling in two directions, so that when melted wax is poured from a spoon at the upper corner of the V-shaped trough formed by the foundation and section it will slowly run to the other side, thus fastening the foundation securely to the section. If we begin at one end and put on a section and foundation till we get to the other, the first will be cool and ready to take off when we get to it so that no time is lost waiting for the wax to cool. In this way I can put in foundation almost as quickly as I can handle foundation and section. The sections filled with foundation are next put in wide frames holding but one tier of sections deep, and having separators nailed to them, for after repeated trials I con-

* These dates are for the Northern Hemisphere. May, June, July, and August, in America, will correspond in to October, November, December and January in Australia.

sider the no-separator plan a move in the wrong direction. Other wide frames are filled with sections containing comb left over from the season previous, which combs I consider of great value in getting the bees at work quickly in them. One or two are claiming that these combs should be cut out and melted into wax, the sections being burned, but it seems to me a person advising such a procedure cannot be in his right mind, for with me they are of great value, and when filled are in no way inferior to that built from foundation the same season it is put on the hive.

Having all in readiness I take one wide frame of sections containing the empty comb and place it over the centre of the brood nest, when two wide frames of section filled with foundation are placed on either side of it, thus giving a capacity of about 20 lbs., which I consider ample for the largest colony at first, for if too much room is given on the start it seems to discourage the bees. On either side of the wide frames two thin boards are placed to close the whole like a box, the boards being held in place, and the wide frames as well, being clamped together by coil brass wire springs. It takes but a few moments to put them on as a whole load is wheeled right into the apiary alongside of any hive you desire. In a week or so, as soon as the bees are well at work in what sections have been given, unclamp them and put in two or four more wide frames of sections, putting them where four are used, in each alternate space after spreading the five wide frames apart, when the whole nine are again clamped together as before; when a colony is not strong enough to work to advantage in so many, put in only one or two, putting these on either side next the one filled with comb. In this way the bees are coaxed to work with all the energy possible, and I much prefer the plan to tiering up, because only so few as two wide frames can be used on the smaller colonies while my hive room allows twelve for the largest, or about 60 lbs. capacity, which is as large as I ever wish to use, for often the second time putting on there are wide frames full of honey coming off every time more is put on. I formerly used side boxes, but since I have adopted chaff hives, I find that the bees work to just as good or a little better advantage when the sections are spread out laterally, and to much better advantage than when tiered up. As the season draws to a close the empty sections are placed at the outside of those partly filled, so that when the season closes there are few unfinished sections and but few inch frames on each hive. After two years' testing of this lateral movement of wide frames of sections, I consider it far in advance of any plan yet devised for comb honey, as you can accommodate the size of the hive to suit the size of the colony, in a very few moments, from a two-frame nucleus up to a powerful colony. Some seem to think that bees will

not work in sections that spread out beyond the brood, but Father Langstroth gave us the real facts when he said bees would work to advantage anywhere, when the heat and odour from the hive reached.

The sections being all on, and the bees well at work in them, the next thing we may expect will be swarming. It will be remembered that for years I have called foundation in the brood chamber an "expensive luxury," for I could get comb built below, while the bees were at work in the sections at apparently no cost whatever. For thus opposing foundation in the brood chamber I have been ridiculed and called a fanatic for years, but now I am glad to see that Brother Hutchinson and others are adopting my plan, so they will help bear some of the criticisms I have borne all alone for years.

Before a queen-excluding honey board was used I hived my swarm in a hive containing ten frames with a division board in the centre, under which the bees could run, so that in whichever side the queen chanced to go there the bees commenced work. In twenty-four hours after the brood nest became established I put on the sections from the old hive, which were immediately taken possession of, thus securing the five frames filled entirely with worker comb, for if any drone comb was built it was built in the sections, but since I use foundation in the sections I get little drone comb built anywhere. When the queen-excluding honey board was thought of I adopted the following while the swarm was in the air: a frame of brood and the few adhering bees were taken from the hive and put in an empty hive, and five empty frames having starters in them (of foundation) were put in where they came from, the rest of the hive being filled out with dummies. The queen-excluding honey board is now put on, the sections replaced and the swarms returned.* In these two ways I have worked for more than ten years securing two objects, lots of comb honey, and all worker comb built without the use of foundation. If the beekeeper wishes to keep these swarms for winter he will spread the combs apart after

*[This paragraph is somewhat incomprehensible; there must be misprint or error somewhere. How five frames with starters can go in the place of one brood frame we cannot understand. Our interpretation is—"a frame of brood and the few adhering bees were taken from the hive (whence the swarm issued), and put into an empty hive with five frames having starters of foundation in them (a single frame with starter being put in place of the brood comb in the parent hive); the remaining space in the new hive being filled with dummies. This gives the contracted brood chamber advised for swarms. The writer thus intends the honey board and sections to go in the new hive into which the swarm is then housed.—Ed.]

twenty-four days and insert four empty combs, as I gave directions in the *Api* for 1886. If not he will use them up, getting honey according to the plan advised by friend Demaree of Kentucky. As soon as the old colony gets a laying queen two or more wide frames of sections are placed on these according to their strength so that all are kept adding their mite to the aggregate season's crop. I might go on and multiply words regarding this great subject of getting comb honey, but as this article is already too long I will stop here, trusting that I have made all sufficiently plain to enable the reader to secure a good yield of section honey.

In closing let me emphasise that of all other things the getting of the bees in time for the harvest is the most essential point, and the next is keeping of all hands to work by adapting the size of the brood-chamber and amount of surplus room to the size of the colony. Failing in these two you fail of a crop. Succeeding in these you are sure of a good harvest if the flowers secrete honey.

(To be continued)

SWARMS—NATURAL AND ARTIFICIAL.

British Bee Journal.

PROBABLY the advocates of artificial swarming outnumber those who prefer the natural system. The objections to the latter are said to be uncertainty, inconvenience, waste of time, undesirable increase, loss of swarms, multiplication of small and useless second swarms, settling in inconvenient places, refusal to swarm at all, and remaining idle at home, &c. Bearing all this in mind, we have never seen artificial swarms work with half the energy of natural ones, and the queens, reared under the natural impulse, are almost invariably the longest-lived and the most prolific. The management of an apiary must, of course, be conducted according to the intentions of its owner, whether, for instance, it is worked for the production of comb or extracted honey, for increase with a view to the sale of bees, or for queen-raising, or even for a combination of all these points.

But whenever it can be arranged to indulge, without actual loss, the natural instinct or propensity to swarm, we strongly advocate doing so. Much depends on weather. In some seasons there is very little disposition to swarm. In others, it is next to impossible to prevent the issuing of swarms from half-finished supers, notwithstanding that plenty of room has been given in all directions. In "U. N.," of 15th April last (*B.B.J.*, vol. xiv., p. 162), we gave, under the head of "Preventing After-Swarms," a modified plan of the Heddon system, which we have practised successfully, and which gratifies the natural instinct for swarming, either with or without increase, and while working for comb or extracted honey.

With slight alteration, or adaption to circumstances, we think the plan would prove successful in all cases. For example: when a swarm has been installed in the position of its parent, with the rack of sections over it, brood combs, minus queen-cells, at an interval of a day or two, may be transferred from the latter to the former, more room being afforded, and an additional rack added; so that a constant addition of young bees is made to the swarm at the expense of the parent colony, which, no increase being desired, is not allowed to rear a queen, or to do so in nucleus only.

Under the swarm-preventing plan, when a swarm is put back, and the queen cells are cut out, the bees work with little or no energy, and more often than not, sulk, and refuse to work at all; and swarming is prevented at the loss of honey. When "putting back" is practised, it is always best to give room below the nest, by adding with a small sectional hive, about 6in. deep, containing frames of 4in. depth, placed at 1½in. from centre to centre, and having full sheets of worker-celled foundations, and drone larvae should be destroyed when excising queen-cells. At the same time, more super room may be given if honey is coming in fast.

Mr. Demaree states that, if he wishes to prevent further increase, he places his swarms on half the usual number of Langstroth frames (equal to about seven English Standard frames), using only "starters" in them, and fills up the space at the sides of the frames with division boards, standing a half-inch apart. Over all he places queen-excluder zinc, and upon it sets the first tier of surplus cases.

By this management the whole force of the new swarm is spent in producing surplus, and comes out as a mere nucleus, being disposed of as such, at the close of the season, either by uniting, or allowing it to perish.

The parent colony is allowed to raise its queen, and is retained in stock. If increase is desired, he gives the swarms on full sets of frames (equal to twelve English Standards) filled with worker-foundation, and gives the colonies abundance of room as fast as they require it, practising the tiering system to supply their needs.

If the queens are old there will be danger of swarms issuing; but, as a rule, no swarms will issue from new colonies if the queens are satisfactory to the workers. This influence, or queen condition, gives the key to the situation. In practising this plan, the swarm should occupy the position of the parent colony, the latter being removed to a new stand.

If the queen which leads off the swarm is more than two years old, the introduction of a fertile young queen would go far to prevent all probability of swarming.

To practice either of these systems to the greatest advantage, fertilised young queens should be introduced to the parent colonies immediately after swarming, and shortly afterwards surplus cases given.

By these plans, whether increase is desired or not, the natural instinct of the bees is gratified, and the swarming energy is utilised; a far more satisfactory practice, to our ideas, than the usual artificial system of "making two out of three, &c.," recommended in our English apiaries.

Lose no time in completing all possible preparations for the coming season.

HIVES AND STANDARD FRAMES.

British Bee Journal, Jan. 1887.

IN our last "Hints" we confessed to a longing for a larger frame, which might be worked in in connection with the present Standard, and expressed an opinion that such a frame might be successfully introduced by private enterprise. We are pleased to learn that Mr. Simmins is of the same opinion, and that for three years his brain has been at work on the subject, resulting in the production of a hive for which he is now obtaining a patent. By the courtesy of the inventor we have been favored with a sight of the drawings, and a full description of the hive. To this hive Mr. Simmins referred in his letter (No. 700) and stated that if there appeared a desire for a larger frame, he might at some future date describe the hive he used, in which could be worked advantageously a 14 x 14 frame, together with the present Standard. Without going into a full description of the hive, which, we hope, together with the drawings, may shortly appear in the Journal, we may say that the distinctive features of the hive consist of four novelties, which are to be more particularly by patent, viz.:—(1). A key arrangement for holding shallow frames and skeleton section holders in place for inversion, when desired. (2). Folding skeleton section frames, which can be used either with or without a rack, in various parts of the hive. (3). A pliable adapting board, and (4) a weather rabbit for protecting the joints of the hive. Besides these, there are other features entirely new to us, such as metal rests let into saw cuts on floor board: a sunk floor-board forming a permanent feeder; as hive entrances, small circular holes; the plan of suspending the 14-inch frames, which are partly close-ended; bee-space provided at top of frames instead of bottom; an ingenious and simple plan of enlarging or diminishing the bee-space; the shallow or super-frames (12 x 6) standing on end close up to the larger ones, &c. The hive itself, when complete with roof, forms a most picturesque object, and its appearance is thoroughly English, sound, and substantial, and it is clearly impervious to weather.

Taken as a whole it is simplicity itself, notwithstanding its various parts—all of which can be worked on the invertible system—although Mr. Simmins is not an advocate of the plan—and we cannot but augur a successful future for a hive which unites in itself so many good points, and which can be worked with the greatest ease, both with the Standard and larger frames.

SIMPLICITY IN FEEDING,

British Bee Journal, Jan. 13, 1887.

(761).—At one time I looked upon the work of feeding in large apiaries as one of the greatest annoyances, and the necessary preparation a waste of valuable time. Syrup had to be made over a stove before it was thought possible that it could be appropriated by the bees. I was satisfied that all this labor could be avoided, and before establishing out-apiaries I determined, if possible, that it should be done. The result of careful experiments was the present system known as dry-sugar feeding, by means of dummies filled and arranged at the side of the brood nest. Though the term applied to the new process was not exactly correct, as the sugar used (Porto-Rico) is moist and soft, it is thus distinguished from syrup feeding, and appears appropriate.

Though invaluable for stimulative purposes, and in some cases to complete storage, at times it was still necessary to give syrup, when desirable, to feed rapidly, but this difficulty has been overcome by my self-acting syrup feeders. There was still, however, one other point to be overcome.

Many stocks are either neglected by their owner, or happen to run short of food before it is possible to feed in the ordinary way. Hence the use of "candy" during winter, than which there is no more troublesome nor expensive food to make; expensive because of the great waste of time taken in its manufacture, when one might be profitably employed at something far more remunerative.

It is pretty well understood by practical beekeepers that the only suitable candy is that which always presents a moist surface to the bees, without wasting too freely, great care being required to get it just right, as, if too dry, the bees will not make much use of it until they can obtain water; while, if too soft the whole will run away in waste, making everything sticky, the poor bees included, and thus doing more harm than good.

When I say that I have struck the "happy medium," and no more cooking is required, even for winter feeding, or for supplementing the stores of those running short before spring opens, the importance of the following plan of giving uncooked sugar without the expense of a feeder will be acknowledged. Porto-Rico sugar is of exactly the right condition to take the place of candy, if only properly applied.

There is only one way that I have found it can be done without waste where the bees are admitted to the sugar from the bottom of the lump, and that is, when placed on the frames just over the cluster, and pressed down tightly. First lay a sheet of newspaper over the frames, on this place several pounds of the above-mentioned sugar and press it down well all round. It then forms into a cake with a crust that I have known to support the weight of clustering bees and newly built combs, after the bulk had been used in spring, just as if it had been an inverted dish. No grains are wasted—first, because of the pressure, and then the moisture of the hive causing all to adhere closely together. No liquid appears, and yet the sugar is always in the best possible condition for use. The body of sugar adds an additional protection to the bees, and, unlike sticks of candy, the crust is left till last, forming a complete air-chamber immediately above the cluster. A strong colony will soon open a way through the paper where it bulges down between the frames. For a weak lot a tear should be made to give them a start. Instead of paper a piece of cheese-cloth can be placed first on the frame, and would be preferable if applied in midwinter. It is hardly necessary to state that this sugar can be moulded to any shape to suit the formation of roof or quilting, which latter should be very warm. For slow feeding, where it is known the bees have some stores on hand, or for brood stimulation later, porous cloth only need be applied; and where the case is urgent, or more rapid feeding is necessary, place a piece of oiled cloth next above the sugar, with smooth side to the same.

In cases of emergency, where bees have been bought in spring short of food, and being in odd hives, I have placed the usual dry-feeding dummy close on top of the frames, with the slot next to but standing across them. The hives being smaller than the standard, no other feeders were at hand suitable. When covered up warm the sugar soon disappeared, and though side feeding is at times more convenient to the beekeeper, without a doubt in cool weather, there is no place so suitable for the bees wherefrom to take their food as that immediately above the cluster. I do not suppose every one will discontinue the preparation of bee food by cooking, but at my own apiaries, of several hundred colonies, no time is now wasted in that manner, and I have no doubt this last application of dry-sugar feeding will be welcomed by many who are now getting anxious about the condition of their stocks.

S. SIMMONS.

STIMULATING.

From American Bee Journal.

By "stimulation," is usually understood, a supply of food given in dribblets, generally at spring time. The system has its advocates

and opponents. The former argue that the bees and queen, perceiving that food is coming in, are incited thereby to earlier preparation for brood-rearing than would otherwise have taken place. The latter, granting this, are of opinion that the bees, stimulated to early brood-rearing, are induced to leave the hive in search of pollen, water, or food at unreasonable times, and during the prevalence of cold spring winds, and so perish in numbers, being chilled, and unable to reach their hives; hence follows spring dwindling, with its attendant evils, until finally the colony is often lost.

In our opinion, spring dwindling arises chiefly from another cause, viz., dysentery or diarrhoea. The intestines having become disensed by improper food, and too low a temperature, the vitality of the colony is reduced, and that to so great an extent that its members perish while in search of food, and in the performance of their heavy spring labors. Once entered upon the downward road the final catastrophe soon follows—the brood-nest becoming circumscribed. No matter how prolific the queen may be, it gradually becomes less and less; eggs laid are neglected or devoured, owing to the paucity of nurse bees to incubate them, and the end comes through robbery, desertion, or death.

We have never found judicious feeding of fairly populous colonies at spring injurious, but care must be taken to feed so sparingly, that the brood nest shall not become a repository for food instead of brood.

Many colonies have at spring more honey than their wants demand. In such cases, we prefer the repeated uncapping of a few cells near the brood nest to give syrup, the stimulating effect being quite as great, and, as the brood is extended, and the outer clogged honeycombs may be extracted and returned to the hive. This plan is productive of more extensive, and more certain stimulation of brood-rearing, than any other with which we are acquainted.

EXHIBIT OF HONEY. It was estimated that there were 20 tons honey exhibited at the Indian and Colonial Exhibition.

STING PREVENTERS.—In our account of the meeting of the Victorian Beekeepers' Association, reference is made to the discovery and use of certain substances to prevent bees stinging the hands and face when handling hives. The substance is in the shape of an oily fluid, which has to be smeared over the skin, and it is stated by many to act quite like a charm. There is, however, considerable controversy about the value of these substances, or "Apifuges," as they are called, especially about the merits of two kinds of substances sold by different dealers. The most favorable testimony is given of "Grimshaw's Fluid," which is now advertised for sale at 1s. 6d. to 2s. 6d. per bottle by Abbott Brothers, Southall, London.

Queries and Replies.

QUESTION.

Question 7.—Mr. Editor, this being my first year at bee-keeping, I shall be glad if you will tell me how to prevent mould, which I found on the corner of a mat when I opened a 14 story simplicity hive a few days ago. I have eight frames in brood chamber with plenty of stores, a chaff division board *à la* Root on one side, all covered with a piece of sugar matting. I now find that I have too many frames for the number of bees, would it be advisable at this season of the year to open my hive, reduce to, say, six frames, add another chaff division board and cover with a chaff cushion about one inch thick? This is the plan I propose to follow in future, do you think it suitable for a district like Kyneton, where in winter we expect heavy frosts and plenty of rain? By kindly answering these queries you will oblige.

J. S. J., Kyneton.

REPLIES.

Reply No. 3.—We would refer J. S. to Page 33 of last year's journal, where a method of making a Langstroth hive from a kerosene case is described by Mr. C. Clough of South Australia. We would also refer him to Mr. Watts' letter in our present number, and we advise him to see Mr. Watts' hive if possible, at the next association meeting, or at the place where it will be arranged for the hive to be kept for inspection. A method of making a frame hive with a gin case will be given in our next number.

Reply 4.—The best food for bees now is either good honey taken from healthy bees, or white sugar syrup. Make the syrup very thick; if, however, you put more than 2 lbs. of white crystallised sugar to a pint of water, much will crystallise out when cold. To obviate this, add vinegar, or better, tartaric acid:—2½ lb. or even 3 lbs. of sugar dissolved in one pint of water, over a gentle fire, keeping the syrup well stirred to prevent burning, to which a little tartaric acid has been added while still hot, will remain a thick syrup without crystallising; about 20 grains will be sufficient for the quantity of syrup given. This will be just the right thing for bees this time of year. Thin syrup is objectionable until hot dry weather sets in. As yours is a box hive, you had better feed from a shallow vessel placed on the floor board under the hive. A shallow tin dish, say 6 inches square, or a round one 6 inches diameter with a thin piece of board to fit loosely inside, having a few ¼-inch holes bored through, will answer the purpose. In the evening raise the hive gently, place the tin on the floor board, nearly fill it with syrup and float the perforated board on it; the bees will

take the food through the openings, and around the edge of the board which gives good foothold to the bees, and saves them from drowning. Sometimes the board will curl up at first, but it will soon flatten again. A good way to prevent this warping is to dip it in melted wax for a minute or so, before first floating it on the syrup.

Reply 5.—The flower you refer to is known as the scarlet bottle brush, its botanical name is *callistemon*; there are several varieties such as *callistemon rigidus*, *C. coccinea*, or *C. linearis*, &c., all excellent honey trees.

Reply 6.—Transferring is not to be recommended; better feed up and get an early swarm, or when the spring is a little more advanced, drive the bees out and put them into your hive with frames full of foundation, and feed freely; if there is any brood, take one of the best combs and fix in one of the frames, and the bees will take to their new home much more contentedly. If there is hatching brood, place the old box hive in some warm corner for a week or two, and most of the young bees will hatch out and can be afterwards added to the stock.

Reply No. 7.—The past season has been extremely damp in Victoria, and mildewed mats and outside combs are complained of generally. A little top ventilation is desirable and if the mats are very much mildewed, new ones should be given. If mats before using are dipped in a solution of salicylic acid and dried it will prevent mildew. In the Kyneton climate a dry chaff cushion until October will be advantageous. If all your combs are not covered by the bees, put in a division board so as to enclose those that are, and the empty combs can be given as the colony increases.—Ed.

BEEKEEPERS' ASSOCIATION IN SYDNEY.—Our beekeeping friends in Sydney are, we hear, contemplating the formation of a society or association in that city; we hope they will succeed and form a strong society. Apiculture is rapidly growing in N.S.W., and will probably become an important industry. It would be a wise thing for all the colonial associations to affiliate into an *Australian Beekeepers' Association*.

PAINTING HIVES INSIDE.—There has been much talk among British beekeepers about the desirability of painting or varnishing the inside of hives; some advocating that course to prevent absorption of moisture into the wood and also to lessen the danger of adherence of disease germs in any little crevices or roughness of the timber used, and speak highly of their experience of the practice; others condemn it totally. A hive painted or varnished inside with proper material would no doubt be easily cleaned and freed from disease germs, but experience appears to be the only safe guide in such matters.

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VOL. II.—No. 4.]

SEPTEMBER 10, 1887.

[PRICE 6D.]

Editorial.

HINTS FOR OCTOBER.

SHOULD the weather be favorable, this month will be a busy time for both for bees and beekeepers. Strong stocks that have not already swarmed may be now expected to do so. The mode of dealing with the swarms, as pointed out last month, will depend upon whether the beekeeper wishes to increase his stocks, or to secure all the honey he can. Both cannot well be done unless he chooses to keep part of his colonies for increase and part for honey. To those working for comb-honey we cannot do better than advise a careful perusal of the articles in this and last month's number, entitled "*Comb Honey*," copied from the *American Apiculturist*.

So many complained last season of the difficulty of removing sections after they were filled in consequence of brace comb connecting them with the tops of the frames beneath. The difficulty is simply owing to there being too much space between the bottoms of the sections or frames in the supers and the tops of the brood frames, which should never exceed $\frac{1}{8}$ of an inch, unless a honey board is used. A correspondent, Mr. Watts, in our last number says, leaving the mat on the central brood frames, but not covering the outside frames, gets over the difficulty. Mr. Heddon declares his honey board is the best plan. Other apiarists swear by their own particular honey boards, while others again use and advise the perforated zinc honey board (Queen excluding zinc). We scarcely know which is best. Heddon's is simple and cheap and is described on another page (under article Hives). There can be no doubt that section box work becomes very troublesome and tedious when the bees are permitted to cement supers and brood frames together in one mass, as they certainly will do, unless the space is very accurately

gauged and some contrivances such as a honey board or special mat be used.

Some beekeepers working for extracted honey keep the full number of frames in the brood-box, and as fast as honey is stored in the outside frames they extract it and return the empty combs. It is claimed for this method that it has a tendency to prevent swarming, and that the bees work harder and gather more honey than they will if full combs and section boxes be left in the hive till the honey flow ceases. If this plan is adopted, the best way is to contract the brood chamber to 8 frames, which will all be used by the queen if she be good, the colony strong and the season favorable, and keep all the surplus honey stored in frames in the super. Extracting can then be carried on without disturbing the brood chamber so often. If the weather be at all dry, water must be supplied to the bees in the neighborhood of the hives; for this purpose a regular bee-fountain should be used or a home-made contrivance substituted. A simple way is to get a small barrel or tub with a cover, fill with water and hang some stripes of bagging or old sacks over the edge, so that one end of the strips dips in the water and the other end hang outside the barrel, reaching below the level of the water. The result of this arrangement is that the strips syphon off the water slowly and are constantly soaked. When once the bees find this out, it will be pretty freely visited on every warm, dry day.

Our first honey flow is usually well established toward the middle of this month, and where surplus is coming in rapidly, care should be taken to give the bees plenty of storage room. If shallow supers of sections are getting well filled, don't wait till the sections are all filled and sealed, but when half filled lift it off and place a second half story super with sections on the brood chamber and the half filled super on the top. This mode of

proceeding is called tiering up and is, we think, the best course to adopt when honey is coming in freely. During October it is not unusual to have a period of very cold and stormy weather, which gives bees a sudden check, and in strong colonies that are breeding rapidly often brings a strain on their resources. This should be guarded against by being prepared to feed freely any colonies that are short of stores; for, as we stated last month, an occurrence of this kind, unless met by ready help, will greatly diminish the working power of our strongest stocks.

FOUL BROOD.

THIS destructive disease appears to be doing serious damage to many apiaries in the colonies, and affecting most injuriously the beekeeping industry generally. From accounts we receive it would appear to be on the increase, but this may, perhaps, be explained on the ground that until lately it was only the experienced beekeeper that recognised the disease. Increased knowledge has, however, enabled many others to detect the symptoms of this plague, and what used to be simply put down as "moth" or "some disease" is now found to be *foul brood*.

The first step towards staying the destructive spread of foul brood is to *know it*, and to quickly detect its first appearance. The second step is to take immediate measures to arrest its spreading; but this is a somewhat troublesome task, and is therefore, unfortunately, too often neglected, and the pest inevitably spreads.

It is no uncommon thing to see a hive, started by some would-be beekeeper, standing in a garden with no signs of life about it, and on enquiry be told that "the bees had done well for a time, but had then dwindled away with some disease till there was not a bee left, and we have not bothered with them any more." Lifting the hive cover reveals a mass of putrid combs, all the honey having been taken by bees from other hives in the neighborhood, and with it certain destruction to the hive to which it was taken. In this way the disease spreads, and one careless *would-be* apiarist actually contaminates a whole neighborhood. If foul brood is permitted to run rife and unchecked in this way, beekeeping will soon become an industry of the past; for do what we will, so long as the disease exists, and we have wild bees in the forests, the same danger we have recited will always remain to some extent. If, however, every one who keeps bees, or attempts to do, will understand his responsibility in this direction, as he would have to do if he had scarlet fever in his house or infectious disease in his sheep or cattle, the progress of the mischief would be enormously decreased. To know and to be able to recognise the disease is, therefore, a most important matter to beekeepers.

We have clearly described the symptoms and appearances in former numbers, and we desire now to point out what are the best courses to adopt to stay, as far as possible, the spread of the disease beyond the hives it may be discovered in, and it may be even to cure an affected stock. A beekeeper once assured he has foul brood among his bees has a responsibility on his shoulders with respect to all other beekeepers in his district which should be honestly and manfully accepted.

A case of foul brood in a box hive admits of no attempt at cure, nor any middle course; it must be either totally destroyed by sulphuring, and the box, bees, and all burnt, avoiding all chance of other bees getting at the combs; or, having killed all the bees by sulphur, shake them out into a fire, remove the combs, placing all containing brood in the fire, and throwing all the rest into *boiling water* for wax. If there is much honey, this may be saved and *boiled* to feed bees; but there is always danger of other bees getting at the combs during manipulation and taking the infection to other hives. We prefer total destruction of combs and box, as well as bees, for all that can be saved from a diseased stock scarcely pays for the trouble, let alone the risk of spreading the disease. Instead of destroying the bees we may "drive" or "drum" them into a clean box and let them begin life again, feeding them with food medicated with phenol or salicylic acid. Burn the old box, combs and all, in a big fire out of doors, and do it so quickly that no other bees can get at the combs or honey.

This latter course is often successful in eradicating the disease, and, at all events, it makes it a "clean colony," for a time at least, even if, as sometimes happens, it reappears.

As bees from an infected hive entering another clean hive will very often carry infection, it will be necessary to do the driving by the *close* method, where no bees can get out during the operation; it is also necessary, therefore, that the driving should be done in the evening, when all the bees are at home, or in the very early morning before any go out.

In the case of frame hives we have more courses open to us, but even then, if the disease is thoroughly established and general in the hive, total destruction we believe to be the safest course.

When the disease is not far advanced we may attempt a cure, but our responsibility with respect to the spread of the disease, either among our own or our neighbor's bees, must not be overlooked.

(To be continued.)

Two little boys were discussing the strength of a bee:—"He can pull more than a fly," said one of them. "Well," said the other, "I dunno how much he can pull; but when he backs up to you and pushes, I guess you'll fall back every time."

Original Contributions.

HIVES.

CONTINUED FROM PAGE 23.

TOWARDS the end of our article in the last number on hives reference was made to raising the brood-box and frames somewhat higher than the ordinary $\frac{3}{4}$ from the bottom by means of a $\frac{1}{4}$ inch slip nailed around the two sides and back of bottom board, omitting it in front, thus leaving an entrance $\frac{1}{4}$ inch high and the whole width of the hive. In Heddon's new hive, and several other hives of recent pattern, the height of this entrance is full bee space, or $\frac{3}{8}$ of an inch.

There seems a tendency among American apiarists to limit the number of frames in the brood-box from 10 to 8, as it is stated the bees will store in supers earlier and more readily if the number of frames are barely more than would be filled by brood in a strong colony.

SUPERS, HALF STORY AND FULL STORY.—Supers may be either of half story or full story depth. In both of these either 1 lb. section boxes for comb honey or frames for extracting may be used for surplus honey. If extracted honey is to be worked for, ordinary frames will suit for the full story super, indeed it will be a counterpart of the brood chamber. If a half-story the frames will be the same length as in the brood chamber, but only $4\frac{1}{2}$ inches deep instead of $9\frac{1}{2}$, as in the full frame.

If section boxes are to be used, either wide frames for holding them, or a crate or rack to fit inside the super and to hold the section boxes will be required.

Section boxes are now so well known as scarcely to need description, we may, however, state for the sake of beginners, that they are made from thin boards of willow, poplar, or clear pine, about $\frac{1}{4}$ thick and $1\frac{1}{2}$ inches wide. Four pieces form a box, each piece being $4\frac{1}{2}$ long. Although called a box, it is in reality a small frame and when filled holds just about 1 lb. of honey. They are made so cheaply now by the American and English manufacturers that no one would think of constructing any for themselves. The cost in the colonies is about 25s. per 1000. They can be obtained in packages "in the flat," that is, the wood is made all ready to slip together and are either in four pieces with dovetailed ends to each piece, by means of which they are quickly fitted together, or in one long piece (called one piece sections) dovetailed at the two ends like the other form of section, and having a V groove at proper distances, which makes the wood so thin at these places that the slip can be easily bent into the proper form and the dovetailed ends fixed together when the box or frame is formed.

Although full storied supers are sometimes used in rich honey-producing localities, they are regarded as unhandy, and most beekeepers prefer two half story supers to a full one.

Section boxes as stated above may be fitted in the supers either by help of wide frames, or of crates or racks. For wide frames the super must be provided with the usual rabbet and tin runners. The frames themselves are made as follows:—Top bars $19\frac{1}{2}$ in. long, $1\frac{1}{2}$ in. wide and $\frac{1}{4}$ in. thick; end bars $4\frac{1}{2}$ in. long, $1\frac{1}{2}$ in. wide and $\frac{1}{4}$ in. thick; bottom bars $17\frac{1}{2}$ in. long, $1\frac{1}{2}$ in. wide and $\frac{1}{4}$ in. thick; bottom sides of end bars to be nailed to end of bottom bar.

Crates are light frames or trays made to fit inside the super and hold 28 section boxes. They are made in various forms, but there is one essential feature that we advise should be always carefully attended to, namely, the form and character of the bottom of the crate, which really forms a "honey board;" the same feature is equally important where the sections are in wide frames. Whenever any frames or boxes are placed above the brood nest, bees are almost sure to fill up the intervening space with wax or comb, so as to connect the brood frames beneath to the boxes or frames above, if they possibly can. If there is no space left between them they glue them together with *propolis*, and if there be space, they fix them with wax and if the space be large enough, with actual comb. It is found that if there is a bare bee-space ($\frac{3}{8}$ of an inch), they do not fix them together so much, but often sufficiently to make it difficult to take out the crate or remove the super frames without breakage, and angering the bees. The best plan of all is that adopted by Heddon and other American beekeepers, namely, to arrange a honey board of thin slats (the same length as the frames and about an inch wide) in such a way, that the slats themselves are exactly over the spaces between the frames, while the spaces between the slats themselves (about a $\frac{1}{4}$ of an inch wide) are over the centre of the top bars of the frames, the slats being nearly $\frac{3}{8}$ of an inch above the frames. By this contrivance the passages upwards are interrupted by the slats, which make a break-joint honey board. Of course, it is essential the frames are all properly arranged and spaced in the brood box, so that the slats cover the spaces exactly. Such an arrangement is known as Heddon's Honey Board.

(To be continued.)

OBJECTIONS TO TOO FREE USE OF FOUNDATION.—Several experienced apiculturists are suggesting that we are doing wrong to supply all the wax bees require for their combs in the shape of foundation, and contend it is better for the bees, and for their keepers, that the natural secretion of wax should take place. They, therefore, advocate the use of shallow "starters" instead of full sheets of foundation in the frames. In cases where bees are put into new hives on account of foul brood in the old one, there is no doubt these cases succeed best where the bees have to secrete nearly all the wax for the new combs.

News and Reports from Colonial Apiaries.

DEW DROP APIARY, MARONG.

THE main source of our honey-supply is the bush; the best two honey-yielding trees being the red gum and box; some of the latter are now in blossom, but the weather is not warm enough for them to yield any honey yet. The red gum blossoms during January and February. Our bees are all Italians; we use the Langstroth hive and keep our bees in the open, and although it is very hot in summer, we find that with the hives painted white, the frames wired, and plenty of ventilation, the bees get along all right. The bees have commenced breeding and if we have fine weather the season promises to be a very favorable one.

J. B. GREENWAY.

Correspondence.

A REMEDY FOR BEE-STINGS.

No. 46.—The following is an account as it appeared in the *British and Colonial Druggist* for July, 1887:—"Castor oil is said to be an infallible remedy for the sting of bees or other insects; it has been tried in Albany, U.S.A., by a number of persons and has given instant relief in almost every instance. The castor oil seems to counteract the poison and allay the pain as soon as applied. The remedy is said, by reliable persons who have tried it, to be a never failing one." I have tried it myself and it acted beyond my expectation. I let the bees sting me well on the hand in four or five places: I immediately applied the castor oil; in a minute or two there was no pain. There did not seem time for pain or swelling, it acted so quickly. One of the stings remained in the wrist for several minutes until the muscles of the bee sting stopped working (which can be seen if looked at closely) and it commenced to get sore and swell, but in ten minutes after the castor oil was applied—*rubbed in*—the soreness and swelling were gone and I could just see where the sting had been. I am sure it will prove a blessing to beekeepers.

August 22, 1887.

WILLIAM DABB.

No. 47.—In one of the German bee journals (Gravenhorst's), I met with a very interesting article on introducing queens, and although few of us might adopt this plan, yet I have learned something from it, therefore I thought it might be of some interest. The writer of the article is a Mr. Sauter, and his views are these:—That there are three different stages to be observed and strictly adhered to in every queenless colony. The first stage, he says, is that of mourning the loss of her majesty. Bees in their distress about their bereavement

are far too excited to receive a queen. The second stage is that of building cells; they will not accept a queen then, for they know that there has not been sufficient time to mature a queen, and therefore they look at an introduced queen as an intruder, and even if the cells are forcibly destroyed, they will at times kill the queen and rebuild cells. But now comes the final, the most important stage, when the cells have been capped. Mr. Sauter says it does not matter whether a queen comes out of a wire cage or out of a cell, at this stage she is always received. Now, gentlemen, as I said in the beginning, it is not likely we shall adopt this plan, but we can learn now the reason why queens are not always well received. For my part I hold that a queen bee must be introduced before the bees arrive at their first stage, that is, as soon as the old one is removed, so that they do not miss her. Although I have not always been successful in introducing on Mr. Simmins' plan, yet I believe that it was my own blundering, and I fully endorse all Mr. Simmins says on it in his pamphlet. The difficulty with me is in Simmins' method, a queen should not be touched with a human finger, but removed from one comb on to another on which she is to be put into the hive by means of a goose quill. But on Mr. F. Benton's plan it does not matter if she is huddled, for she is at once put into the cage, where she soon gains her former composure, particularly if we have a few young bees along with her. In the same journal I also read that for immediate introduction to be successful it is well to exchange the hive to be operated upon with another one in the apiary. By so doing you will lose the old bees on the wing and the other ones returning to the changed hive are then strangers to the new queen and will not interfere. This stands to reason, but it needs a trial, and before long I shall be able to give you a little more on the same subject and on my results with this method.

H. NAVEAU.

Hamilton, August 18.

No. 48.—When I was observing my bees yesterday while they were feeding, I thought it might be well if I described the plan I have adopted this season for feeding them. I have imitated the round box feeder with a tube in the centre through which the bees ascend. To this end I have made a box 6 x 4 x 2 inches high. This is made from very thin boards; the bottom has an oblong hole morticed in it to receive a tube. This box is nailed together so that the bottom between the sides and ends is nailed about $\frac{3}{4}$ inch above the bottom edges, so that a space is formed for the bees to crawl under. The ends I make about $\frac{1}{4}$ of an inch narrower on the top than the sides, so that a pane of glass can rest on them. After the tube has been fitted in, I run melted wax in the feeder to make it air and water tight. Now I fit a pane

of glass on the top box. The tube, therefore, has to be so much lower than the sides that the bees may walk between the edge of the tube and the glass. After this I cut a hole in the quilt where the cluster is, put the feeder on with some sugar or syrup in, and now you can see through the glass how the bees come up in numbers to carry away the contents. This feeder answers more than one purpose; it supports ventilation, yet the pane of glass prevents cold from entering and the vapours from below condense on the lower surface of the glass into drops of pure water; the feeder therefore supplies the bees at once with both food and drink.

H. NAVEAU.

Hamilton, Aug. 25, 1887.

Extracts from Foreign Journals.

OUTLINES OF BEEKEEPING FOR BEGINNERS.

From British Bee Journal.

CONTINUED FROM PAGE 27.

VI.—BEES REQUIRE A DWELLING TO LIVE IN.

1. The honey-bee does not like dirt, and it differs from ordinary domesticated animals kept in stalls and stables, by itself attending to the cleanliness of its own dwelling. It gets rid of its dejections outside of its residence, and when in health never soils the inside; it ventilates it and constantly renews the air, so that the newly-stored honey does not become contaminated by foul smells or unwholesome surroundings. A stall always has a bad smell; it is, therefore, not right to speak of a *stall* of bees (an expression not at all uncommon in some country districts). The dwellings in which bees live and build their combs are called hives.

2. Wind, wet, and cold, are injurious to bees; the hive must, therefore, be well protected against these. A good hive must be warm, have a good covering, and it must be placed in such a position that the keen north-east and the moist south-west winds do not easily find their way into the entrance-hole.

3. Hives are made of different materials and vary in shape. Those formerly in use were called *skeps*; although these are still found, and are extensively used by villagers, modern beekeepers have adopted wooden boxes, as in every way preferable.

4. Skeps are usually made of straw, and are generally dome-shaped, or circular with flat tops, having a hole in the crown. They are worked on the swarming principle, and have fixed combs. The modern wooden boxes used for hives have even sides, generally at right angles to each other. In them the combs are moveable, and for this reason they are called *moveable comb-hives*. They offer greater facilities for manipulation than skeps; at the

same time they present considerable advantages, and if managed properly, enable the beekeeper to obtain a very much larger quantity of honey.

5. Besides skeps and moveable comb-hives, there are what are called *Stewarton* hives. These are also of wood and are eight-sided (octagonal). The central combs are moveable the outer ones being fixed. Stewarton hives are easy of management and give better results than skeps.

6. Wooden hives should be well made by a good carpenter, who is also a beekeeper and understands the requirements of bees. Accuracy of workmanship is of the greatest importance, and the simpler the construction the more easily will the hives be manipulated. The wood used must be well seasoned, dry yellow deal or pine free from loose knots and cracks.

VII.—THE COMB STRUCTURE IN A HIVE.

1. When a swarm is placed in a hive the bees constituting it begin to build combs. These are made of wax, which is secreted by the bees and appears in the shape of small, thin, five-sided scales between the rings on the under-side of the worker's abdomen. The wax is produced from the honey consumed by the bees, of which several pounds are required to yield one pound of wax.

2. During comb-building the bees hang quietly in clusters. They work up the wax-scales with their jaws, and, by adding a liquid (*saliva*), they knead the wax into a soft paste. Comb-building is commenced at the top and continued downwards, the central division wall or foundation being always begun first. This forms the basis of the cells, which are placed on each side in such a way that the base of one forms portions of the bases of three on the opposite side. Two rows of such cells with a central division constitute a *comb*, and from this shape the cells fit so closely together that no room is wasted.

3. The cells are usually six-sided, and are not quite level, having a slight inclination upwards in the direction of the openings.

4. Only well fed bees can make wax and build combs. When bees are queenless or food is scarce combs are not built.

5. When bees are placed in an empty hive they at first build combs with small cells called *worker-cells*; later, larger cells are constructed, and these are called *drone-cells*. Sometimes the bees change the size of the cells on the same comb, and go from worker to drone, or from drone to worker; they then construct between them irregular-shaped cells, which are called *accommodation* cells. The change is usually made in from one to six rows; these cells may be of almost any shape, and have sometimes five or seven sides.

6. Cells intended for brood are of two regular sizes; those in which workers are bred are one-fifth of an inch between the sides, and five of them measure one inch. Comb

containing such cells is called *worker-comb*. Drones are reared in larger cells a quarter of an inch between the sides, four measuring one inch. Such comb is called *drone-comb*.

7. Brood-combs are of a certain thickness, worker-combs being about seven-eighths of an inch, and drone-combs about one and a quarter inch thick.

8. Both sizes of cells are used for storing honey, and these vary greatly in length. Should these honey cells be afterwards used for brood, they are reduced to the length required.

9. There are sometimes cells of a different shape called *queen-cells*. These are round, resemble somewhat an acorn, are about an inch in length, and one-third of an inch across. They usually hang with their mouths downwards, and are generally found at the edges of the comb.

10. Queen-cells are constructed of a mixture of wax and pollen, making them porous, and are covered with a number of depressions, which give them greater strength. The walls are thick and much material enters into their composition, which, as soon as the queen is hatched, is used elsewhere, the cell being cut down until it resembles a small acorn-cup.

11. The cappings of brood-cells are porous, and consist of a mixture of wax and pollen, those of honey-cells being made of wax only.

12. If the hives are furnished with strips of comb the bees will continue them down, and they will act as guides. Comb may be constructed parallel to the entrance or at right angles to it, the direction being determined by the guides.

VIII.—HIVES WITH MOVEABLE AND FIXED COMBS.

1. According to the old style of beekeeping a swarm was placed into a skep, and the bees were allowed to fill it with combs, which they built in any direction they liked. In such skeps the bees attach the combs to the top and sides, so that they form part of the dwelling and cannot be removed from the hive without cutting them out; boxes were worked in a similar way. This is called the *fixed-comb system*.

2. According to the improved modern system of beekeeping, the swarm is placed into a box fitted with frames, to which are fixed, on the under side of the top-bar, strips of comb, or comb-foundation, which guide the bees and induce them to build their combs in the direction in which the beekeeper wishes them to be. The bees do not attach the combs to the sides of the hive, but build them inside the frames. These frames of comb can be easily taken out, their position inside the hive altered, or they can be removed and replaced by others. This is called the *moveable-comb system*.

3. In order to derive the greatest advantage from the moveable-comb system it is very

important that only one size of frame be used in the apiary, and this must fit into every hive.

4. The British Beekeepers' Association adopted some years ago a Standard frame,* which has come into general use, and we advise the beginner to use no other. The outside dimensions are 14 inches long by 8½ inches deep, the top bar being 17 inches long, ⅜ of an inch thick, the bottom bar ⅜ of an inch, and the side bars ⅜ of an inch thick, the width being ⅜ of an inch.

5. The hives should be made so as to leave a ¼ of an inch passage at the ends of the frames, and not less than ⅜ inch at the bottom. The dimensions of a hive to suit the Standard frame would be 14½ inches wide and 8½ inches high, inside measurement. The length will be in proportion to the number of frames used, allowing 1½ inches for each frame. The hive can be extended to take any number of frames, but generally ten or eleven are used. For a ten-frame hive, placing them at 1½ inches from centre to centre 15 inches will be required, and this space will easily take eleven frames when they are wanted closer together, or at a distance of 1½ inches from centre to centre.

6. The frames are frequently provided with broad shoulders, or metal ends, to keep them the proper distance apart, and these have entirely superseded distance-pins, nails, staples, screw-eyes, &c., used formerly so extensively abroad and adopted by some beekeepers here. Metal ends are made of different patterns, Carr's having the advantage that the beekeeper is able to alter the distance of the frames from 1½ to 1¼ inches from centre to centre.

7. The projecting ends of the frames rest on the top edges of the hive, which is here ⅜-inch lower than the sides. When the frames are in the hive the top edges of this and the upper sides of the top-bars will be level.

8. One or two division-boards are necessary for each hive, so as to be able to reduce its size to the strength of the colony. The division-boards fit close inside the hive, and are placed on either side of the frames, the hive being made a little longer to receive them.

9. A moveable bottom board must be provided as well as an entrance at least 8 inches long and ⅜ inch in depth. This entrance can be closed more or less as needed by means of slides or blocks. In front of the entrance an alighting board should extend to some considerable distance, and slope to the ground.

10. Over the tops of the frames is placed what is called a quilt, usually consisting of a piece of unbleached calico, and three or four thicknesses of drugget, or a chaff cushion, box, or some suitable warm material.

11. The hive must have a roof constructed in such a way that there will be room under it

* The dimensions here given are for the British Standard which are much less than the Australian Standard or Langstroth frame.

for placing a feeding bottle or racks of sections (to be described later). A box similar in size to the hive will do, with strips of wood nailed on the lower outside edge, to prevent rain driving in at the joints. The sides and back can be cut down, to give an inclination to the boards fixed on it so that rain will run off the roof at the back, instead of dropping in front of the entrance. The boards should project at least three inches all round, and the roof must be made waterproof.

12. A single hive consists of one box fitted with frames, division-boards, roof, &c. A *storifying* hive is composed of two or more such hives placed one above another, with one roof over them.

13. The more carefully the hives are made, and the more accurately the frames fit, the greater will be the ease of manipulating them.

14. If the beekeeper wishes to make his own hives he had better purchase a good one as a pattern, but in any case he would do better to procure the frames of a hive-maker, unless he has special tools for making them accurately.

15. Good hives are now so cheap that it will hardly pay the beekeeper to make his own. The prices range from 10s. to 15s. for such a hive as we have described.

IX.—WHAT BEES CARRY INTO THE HIVE.

1. Bees do not require to be fed daily like other domestic animals, but collect their own food. They store more than they require for their own use, and only require the beekeeper's assistance if he takes too much from them, or the season has been a bad one. They live upon the sweet juices of plants, which are converted by them into honey, the fertilising dust of flowers (pollen) and water.

2. The best food for them is the *nectar*, which they find in the flowers of many plants. They, however, also collect the sweet juices which are found on the leaves of some plants, and even the liquid excreted by insects, such as the *aphis*, which collects on the leaves. This is called *honey-dew*.

3. From these juices the bees make honey. They convert the nectar into honey by adding a liquid secretion (saliva) which has the property of changing the *cane sugar* of the nectar into the *grape sugar* of honey. The quality of the honey depends, like milk, upon the raw material from which it is made; that from nectar being the best, whilst that from honey-dew is usually very dark and inferior in flavor.

4. Sweet liquids are swallowed and carried into the hive by the bee in the *honey sac*; water is also carried in the same way, whereas pollen is packed in hollows on the hind legs called *pollen baskets*.

5. Bees also collect a resin-like substance called *propolis*, which they obtain from the buds and limbs of trees. It is used to seal up every crevice about the hive.

6. When the bees return to their hive laden, they disgorge the honey into the cells. Both honey and pollen are stored for future use.

Water and propolis are used at once, not stored in the cells, and are only collected as they are wanted.

X.—SWARMS AND SWARMING.

1. If, in spring, a colony has its hive full of comb containing brood, is crowded with bees and food is coming in plentifully, it makes preparations for sending off a swarm. Queen-cells will be constructed in which an impregnated egg is placed. In three days the egg hatches, and a grub (*larva*) crawls out; this is fed on rich food for five days, after which it no longer requires feeding, and is sealed up by the workers in its cell, where it spins a cocoon, and changes into a *chrysalis*. In about sixteen days from the time the egg was laid, the queen, in a perfect state, is ready to leave the cell. The young queen makes, with its jaws, a circular cut in the cell-cap, forces it open, and crawls out. The old queen does not usually wait until this takes place, but generally, soon after the queen-cell has been sealed over, selects a fine day, and between the hours of ten o'clock in the morning and four in the afternoon, leaves the hive with part of the population. This is called *swarming*.

2. The bees which leave with the old queen form with her the *first swarm*, the hive from which they left being the *stock*. In a good season, if the stock be strong, other swarms will issue as the queens mature and hatch out. These are called *casts* or *after-swarms*. Casts have young queens, and are therefore generally better than first swarms, provided they have plenty of bees.

3. The first cast, or second swarm, usually leaves the hive on the ninth day after the first, but occasionally sooner. Sometimes third, fourth, and fifth swarms may be thrown off at intervals, generally, of one or two days. These usually contain so few bees that they are worth very little, and should be united to others.

4. In the south of England, in favorable seasons, swarming begins about the end of April,* but is sometimes delayed until the middle of June. In the north and in Scotland swarming takes place much later, frequently not beginning before the end of May.

5. *Early* and *large* swarms are profitable; *late* and *small* swarms are worth little, although by judicious management they can be built up into strong colonies before the winter.

(To be continued.)

STING PREVENTER.—A writer in the *British Beekeepers' Journal* says:—A drop or two of a mixture made of an ounce of cedar oil and one ounce of olive oil, rubbed on each hand, is very efficacious in preventing bees from stinging, and also keeps away mosquitoes and other insects.

* See page 41 for months in Southern Hemisphere corresponding to certain months in the Northern.

COMB HONEY.

CONTINUED FROM PAGE 43.

American Apiculturist.

METHOD NUMBER TWO.

By DR. G. L. TINKER.

How to Get Strong Colonies.—The success of the apiarist in producing comb honey depends much upon getting strong colonies in time for the harvest. Where the harvest is from the clovers chiefly, colonies must be got in proper condition early by 1st June at the latest, in this locality. If the main crop is derived from the basswood, at least three weeks more time is given to build up strong colonies. Those that have wintered well and are provided with plenty of sealed stores and a good queen will require little attention, and will usually be strong enough to take in their share of the first honey flow.

The most needful requisite in building up colonies in the spring is to see that all have plenty of stores to last at least till fruit bloom. Five Langstroth brood frames will contain the necessary stores for wintering and for brood rearing until 1st May if the bees have proper winter protection. Then if the beekeeper will add several combs of sealed honey at the sides and cover all up warm, breeding will go on rapidly.

Protection is not only necessary in winter but valuable in spring. It always saves in stores to pay the cost, and it invariably secures earlier spring breeding than in other methods of wintering. In any locality where bees can have a few flights in the month of *March* outdoor wintering is the most desirable, since it is these early flights that are the inducements to breeding. As a rule cellar wintered colonies do not breed much till set out in spring. If this should be late in *April* it will often be found that they have not a particle of brood, at the same time many young bees may be seen flying from chaff hives; and it always turns out that the colonies that have the most young bees in *April* will swarm first and make the most comb honey. But if cellar wintered colonies are taken to the summer stands and packed in the latter part of *February* or in early *March* they will do equally well.

Bees may be successfully wintered out of doors on a full set of brood combs in a large packing case, but more protection is required than in cases where the bees are placed on just enough combs to contain the necessary stores. I prefer a brood comb capacity of about 800 square inches of comb surface for winter, and to have the combs in a case made to contain no more nor less. During fruit bloom a similar case of combs, having sealed stores, is placed beneath the first, when the queen and bees will extend their work downward very rapidly. Indeed, with such cases properly constructed, and with proper manage-

ment, it is desirable to have a larger brood space than is usually provided; since a prolific queen can be made to quite fill with brood before 1st June from 1400 to 1800 square inches of comb, or nearly as much as two ordinary eight-frame Langstroth hives may contain. This very large area of brood can be obtained after a colony becomes numerous by simply exchanging, with proper judgment, the combs between two such brood cases. It is quite probable that the eight-frame Langstroth hive could be very successfully managed in this way. The essential point is to have a numerous colony by fruit bloom, but I have already indicated how such colonies can be obtained. In developing these large colonies the beekeeper must see that after fruit bloom the bees have plenty of stores. The interval between fruit bloom and white clover is one in which we cannot afford to stint the bees in the least, for every cent invested for needful food to feed a large amount of brood just before clover bloom will be returned with great profit.

The advantages of this system of management can hardly be estimated as compared with the usual methods. First, we are able to get a great force of workers at a time to be of practical use. And again the queen will be so much exhausted that later on in the season she will not lay so many eggs at a time when they will hatch out non-producing workers. We thus obviate any necessity to limit the work of the queen by cooping her up on one or two combs as has been suggested. Necessarily there will be swarming; but I would ask, why not let bees swarm? For myself, I would not give a fig for a non-swarming hive. If hives are constructed for easy operation it is rather desirable to have bees swarm, as the choicest comb honey is always obtained from the swarms.

The Sections and Supers.—The most comb honey can be obtained by using full sheets of foundation in the sections, and it no doubt pays to use them, but there is no denying the fact that the nicest comb honey is made where starters only are used. It is best to use separators, but not without open side sections. I do not advise, nor would I use, separators with closed side sections, for better results are obtained without them. The sections should be so wide that the bees will not be disposed to store pollen in them. I use and prefer a section $4\frac{1}{2} \times 4\frac{1}{2} \times 1\frac{1}{2}$ with separators. Without separators the $4\frac{1}{2} \times 4\frac{1}{2} \times 7$ to the foot sections are no doubt the best. A section of less width, if filled over shallow brood cases, or even over a contracted case of deep frames, is very liable to contain more or less bee-bread; and it is hardly needful to add that no wise beekeeper will even put such honey on the market, at least during warm weather, as it may be infested by moth worms.

The supers should be adjusted as soon as the colonies become strong in bees, and it is

better that they be adjusted at least a week before the honey flow begins. The first supers put on the hives should always contain one or more sections having one comb built the previous season. These partly filled sections should be put away by every good beekeeper at the close of the season with scrupulous care, as they are very valuable. As soon as the first case is half filled with comb, if honey is coming in fast, an empty super should be placed beneath it and the tiering should continue until three cases are adjusted, if meantime the bees do not swarm. By the time the third case is ready to tier up the upper one will be fully sealed and ready to take off. In none of the operations here described should the bees be smoked unless they prove to be intractable. Any bees that cannot be handled during a honey flow without smoke are undesirable, and should be superseded by a better strain. The practice of many beekeepers of always smoking their bees whenever they open a hive is not a good one. It is far more hurtful than molesting the brood chamber where it can be done without the use of smoke. But as to opening colonies for any needful purpose I have not been able to see that it ever did any harm if done with care.

Inverting Brood Chambers.—The practice of inverting brood cases is no doubt one that has come to stay. There is no other method of placing the brood close up to the sections with equal facility and advantage. It is, however, a question of the proper depth of brood frames as to the propriety of this measure. Cases of very shallow combs may be interchanged with about the same effect, but I desire here to enter an objection against the use of very shallow brood combs. A frame of less than six inches in depth inside is too shallow for anything. It is not a question of wintering on such frames, for I think that bees can be successfully wintered on combs three inches deep; nor is it a question of breeding when the hive is once full of bees, but the trouble is in making the start at breeding in the early spring. The whole season's operations are dependent on this start. A very shallow frame is not deep enough to allow a cluster of reasonable size to rear sufficient brood to push on the work at fruit bloom. From 1st to 10th April are laid the eggs that will hatch out the nurse bees, for the greater part of the brood reared during fruit bloom and early May that we rely upon to gather the harvest. We must have these early nurse bees or fail. We cannot get them on a frame less than six inches in depth in the clear, which is about the depth of the cluster on the cold days of early spring. With a deeper frame, inverting becomes a practical measure that may be depended upon in extending the brood area, and for the removal of the honey to the supers at any time before the queen becomes exhausted by egg laying. After that it is of no use to invert brood combs. But in

any case if the queen continues to lay extensively after the time when the eggs laid would hatch out non-producing workers, I should confine the queen on the case of brood containing the most sealed honey by the use of the honey board, placing the other case above it with the brood as near the supers as it is possible to get it, or if the combs are not too old and dirty I would place the case on the top of the supers, in which case the drones will find their way out of a very small passage near the top of the hive if they can see the light.

The System of Contraction.—In hiving swarms into hives with a contracted brood space, we have a measure at once simple, practical and efficient for the purpose of increasing the production of comb honey. The system originated with and was first made known to the public by G. M. Doolittle. In developing it there is, perhaps, as much credit due to the writer as to anyone who first gave the outlines of the modern system of producing comb honey, from experiments made in 1883 and 1884 with queen-excluding honey boards in connection therewith, in the *American Bee Journal*, Vol. XXI page 101, as I now practice it, a brood case of the proper size (which may contain anywhere from 750 to 850 square inches of comb surface)* a wood and zinc queen-excluding honey board (which is also my invention but now given to the public) and one or more section cases are used in which to hive all swarms. It is only by the use of such a hive that we can take full advantage of natural swarming and turn it at once to practical account. In my experience the work going on in the supers of the old colonies—when transferred to the new ones after swarming—has been accelerated and a larger product is obtained from those that swarm than from those that do not swarm.

The brood frames in all cases are provided with starters as advised originally by Mr. Doolittle. They are cut from brood foundation one to two inches wide, and fastened in the frames with melted wax. As there are few combs to build we have never had much drone comb built, certainly not more than every colony should have; and as the combs are shallow they are always built straight and regular, the spacing being always $1\frac{1}{2}$ inches from centre to centre of frames.

After hiving a swarm the new hive is placed on the old stand and the old one left close by for about three days, when we shake as many bees from the combs in front of the new colony as can be spared and remove it to a new stand. If we delay this operation later there are often many bees killed from fighting. The old colony may not swarm again, if it does the queen cells are cut out and the swarm returned. If it is made up of two brood cases, we can at this time elevate one of them to the top of the supers taking care that the young queen is in the lower case, or we can simply place the

* This would equal six or seven Langstroth frames.

honey board between the brood cases, when the bees have hatched out of the upper case and the combs are all sealed up we may extract them, but the preferable course is to leave the case on the hive till fall. In making ready for winter we shall then find use for it, and if not then it is to be put away for next season's use in building up colonies.

After the harvest is over, and the honey taken from the hives, the bees in the new colonies, having only one brood case, should be united where increase is not desired. To unite full colonies of bees proceed as follows:—take from one of the colonies (after being moved a few feet each day until near each other), the queen; in nine days cut out the queen cells, when one hive can be set upon the other; there will be no quarreling or necessity to cage the remaining queen. In this manner the entire stock of the beekeeper can be reduced to any desirable extent, we consider this course infinitely preferable to the use of non-swarming hives, even if such hives could be made, as the net result in comb honey and honey in brood combs is invariably larger by this arrangement.

I have found that a hive or brood case that is just right for a swarm, is also just right for wintering, but only about one half as large as it ought to be in the spring. If the contracted brood case is too shallow, or if it contain less than 750 square inches of comb surface, the bees will store much pollen in the sections, the above space is therefore the limit of profitable contraction. But if the brood case contains over 850 square inches of comb surface, another evil appears in the form of too much drone comb that will be almost certain to be built where starters alone in brood cases are used as advised. If the ordinary ten framed Langstroth hive is used in which to hive old swarms, we may get a little surplus comb honey from it but oftener none. Division boards should be used in such hives or the unnecessary space filled up with dummies. Then to make the contraction system a success, a queen-excluder should be put on the hive in all cases before hiving a swarm, and at least one super of partly filled sections. In fact the practicability of the system is only fully assured by the use of the new wood and zinc honey-board.

Construction of Honey-Boards.—A simple frame is made as large as the hive or brood case having a groove cut on the inside to receive the ends of the slats and the side slats, and the slats are so placed as to cover the spaces between the brood frames; they are set in the frame so they will rest not over one-fourth of an inch above the top bar of the brood frames. The zinc is let into thin saw cuts in the edges of the slats. Four strips of zinc with a single row of perforations are used, two on each side, and four strips having two rows of perforations, are placed in the middle of the boards for an eight-frame hive; this

gives twelve rows of perforations for the bees to pass through, I have made the boards with strips of zinc having only one row of perforations or eight rows in all, for an eight-frame hive; these have done very well but I feel sure that eight rows of the perforations are not enough on very strong colonies. The boards as here advised are no hindrance to the passage of the bees in storing honey in supers, nor of bees with pollen for that matter, fully as much honey will be stored through them as without them, they also prevent brace combs from being attached to the cases of sections so that the operation of tiering up the cases is always quickly and easily done. I believe their use to be indispensable to the most successful produce of comb honey.

HOW AND WHY PLANTS PRODUCE HONEY.

(A PAPER READ AT THE VERMONT CONVENTION.)

American Bee Journal.

Self-fertilisation takes place where the seed-vessel and pollen are together on the same flower, and come in contact, and cross-fertilisation occurs when pollen from one flower is carried to the seed-vessel of another flower. The reasons why nature desires to cross plants is to secure greater height, weight, and vigor, and more seeds. Most plants are spoiled by self-fertilisation, the same as close breeding in animals; some plants usually self-fertilise, as the pea, lettuce, onion, and ground-nut; but large new varieties of peas are obtained by cross-fertilisation. The means whereby nature obtains cross-fertilisation are three: wind fertilisation, as in grasses; insect fertilisation, as in most flowers; as in honey-snuckles. The prepotency of the pollen from another plant over that from the plant itself, is among the curious features of plant life. Plants also obtain cross-fertilisation by having the pollen and seed-vessels on separate plants, as in the case of willows. On separate parts of the same plant, as in corn, when in the same flower it is attained by having pollen ripen before the seed-vessel; or *vice versa*, as in the plantain, fire-weed, gentian, and verbena. There must be some great benefit in cross-fertilisation to offset the great waste of valuable pollen in some flowers, and small, closed flowers of violet have 100 grains, while the peony has three and one half million grains.

In relation to the means taken by nature to entice insects to plants, it is to be noticed that wind fertilised plants are dull in color, destitute of odour, and contain no honey, as in the case of pines and all conifers, hemp, hop, and grasses. Large, conspicuous flowers are visited much more frequently, and by a greater variety of insects, than small, inconspicuous ones. Bees probably distinguish flowers by bright-colored leaves. When

bright blue flowers were cut off in an experiment, bees crawled over to get other flowers. When the small, upper leaves, which bees do not use to stand on, were cut off, the bees visited the flowers as usual. Odors attract insects, as shown by flowers covered with a muslin net. When possessed of odor they do not so much need color. Fourteen per cent of white flowers have a sweet odour, while only eight per cent of red ones have it. Honey was certainly put in flowers to entice insects. When the honey-sac was cut off a large number of flowers, more than half of them were not visited by insects, and produced no seed. Even dark-colored streaks on colored leaves of flowers are believed to be for guiding the insect to the honey-sac, so that it can suck a greater number of flowers in a given time, and hence produce more perfect cross-fertilisation. As honey is of use to plants only as it helps to cross-fertilise them, it is always placed where it will aid in this.

When mature, the pollen-vessels and the seed-vessels always stand in the pathway leading to the honey-sac. A certain amount of heat is necessary for the formation of honey. With some flowers, if the sun ceases to shine for half an hour, bees will cease to work on them for lack of honey. In most plants the construction of the pollen-glands and the seed-vessels are evidently arranged with the evident intention of making the bees rub against them when it seeks the flower for honey. In such places the pollen is moist or glutinous. In wind-fertilised plants the pollen is dry and powdery, and the seed-vessel is usually sticking out, and hairy, to catch the pollen.

Many flowers are irregular, one or more leaves flattened to serve as a landing-place for the bee, and their honey-sac is on that side of the flower. Violets have large conspicuous flowers adapted to cross-fertilisation, and these flowers are very fragrant, and have much honey. In the harebell the honey-sac is at the bottom of the bell. The pollen-vessels open first, and shed pollen into the bottom of the bell, around the honey-sac. The seed-vessel remains close. Several days later, when the pollen is dead, the seed-vessel opens and receives pollen from other flowers. In the daisy, one head has many flowers. The outer white leaves serve as an attraction and resting-place, and produce no pollen. Inner flowers have pollen-vessels in the form of a hollow tube, into the middle of which the pollen falls, and is pushed up and into view by the tip of the seed-vessel. Afterward, when the seed-vessel is full grown, and most of the pollen has been brushed off, the top opens and exposes the inner face to the seed-vessel to pollen brought from other plants.

In a common garden-bean the stamens shed pollen on the middle of the style. One of the flower leaves is wound into a tube containing both stamens and style. These remain inside

the leaf until a bee alights on the wing petals, then its weight presses down the blossom, and first the end of the style touches the bee, and it gets any pollen which it has brought from the last-visited flower; next, the style sticks out still further, and the pollen on its middle hits the same spot, and prepares the bee for the next flower.

In the lady-slipper the honey-sac is at the bottom of the slipper. The bee enters the large slit on the upper side of the slipper. Edges are inflexed, so that the bee cannot creep out the same way. There are two small holes near the stalk, through which it can get out. In doing so it must brush against the seed-vessel and pollen-masses. If the pollen-masses were first the plant would be self-fertilised, but in fact the seed-vessel comes first, and pollen is carried off to be left on the stigma of the next flower it enters.

Oreohids have a sticky material that will set at once; as soon as the insect's head touches it the honey is free in the sac. When the sticky material requires more time to harden, the honey-sac is empty, and the honey is contained in the lining of the sac, and the bee has to bore through the wall of this lining in several places before it can get all the honey.

Bees have habits which help cross-fertilisation. They work on flowers of one kind as long as they can before changing to another kind. This is not to help the plant, but because they have learned how to stand and work better. Bees search for honey by instinct, by experience, since they work as soon as they emerge from the pupa state. They search introduced plants as readily as native flowers which do not secrete honey, and often try to suck honey out of the honey-sacs that are too long for them to reach. Bees cannot tell without entering a flower whether other bees have exhausted the honey, and hence the flower is more perfectly cross-fertilised. Mr. Miller found that in a certain set of blossoms visited by a bumble bee, four-fifths had been previously visited.

The great number of flowers which bees can visit in a short time greatly increases the chances of any given flower being cross-fertilised. In one minute a bumble-bee visited twenty-four of the closed flowers of flax. In fifteen minutes a single flower on the summit of a plant of evening primrose was visited eight times by various bees. In nineteen minutes every flower on a certain flowering plant was visited twice. In one minute six flowers of a harebell were entered by a pollen-collecting bee, for when collecting pollen they work more slowly than when collecting honey. It was estimated at one time that the flowers in a certain flower-bed were each visited thirty times daily during the week or more than there were in blossom. Bumble-bees in collecting honey fly at the rate of ten miles an hour.

Bees have other habits which are directly opposed to cross-fertilisation. In flowers hav-

ing several honey-sacs, if a bee finds the first one it searches is empty, it does not wait to search the others. Bees often get the honey by biting holes in the blossom and sucking it out of the side. Whole fields of red clover have been examined in which every flower was thus bitten. The biting is done by bumble-bees, and then hive-bees suck through the holes. Bees are very successful in thus biting holes, always hitting the spot outside just over the honey-sac. In all such cases the plant is not fertilised.

The facts are that plants are very thoroughly fertilised by insects. A gentleman marked 310 plants which were incapable of self-fertilisation, and carefully put pollen on the stigma of each day after day; he left an equal number to the insects. His produced 11,237 seeds, and the bees 10,886, a difference of but one in 35, and this difference is fully made up by the fact that he worked during a cold spell with continued rain when the bees did not. Of white clover, 10 heads unprotected gave nearly ten times as many seeds as 10 heads covered with gauze; 20 heads covered produced only one poor seed, and 20 heads open gave 2290 seeds. Of red clover, 100 heads covered gave nothing, and 100 heads open produced 2720 seeds. Insects will abundantly cross-fertilise plants growing one-third to one-half mile apart.

In the United States, hive-bees never suck red clover. In England they only suck it through holes made by bumble-bees. The clover cannot be fertilised by the hive-bee—it is too small—but it is cross-fertilised by the bumble-bee. Hence one gentleman has made this statement: The safety of England depends on the number of cats she keeps. He proves his proposition thus: Without the aid of bumble-bees the red clover could not be fertilised. Bumble-bees make their nests on the ground, where they are the prey of mice. Cats destroy the mice and give the bees a chance to live. Hence he reasons, no cats, many mice; many mice, no bumble-bees; no bees, no clover; no clover, no cattle; no cattle, no beef; and without beef where would the the Englishman be?—**PROF. W. W. COOKE.**

An apiarist in France claims that he has made experiments which prove that only from six to eight pounds of honey are used by the bees to produce a pound of comb.

During the year 1886, 11,000 pounds of beeswax were shipped from California by sea to Europe; 41,000 pounds overland by rail, mostly to New York, and 3,000 pounds via Panama to New York.

BEE PASTURE.—*Lucerne*, or as it is called in America, *Alfafa*, and alsike clover form good bee pasture and produce excellent honey. Farmers who keep bees should remember this: these plants will feed bees and cattle too.

HONEY BEER.—The *Canadian Bee Journal* gives the following receipt:—Boil two handfuls of hops in five gallons of water for fifteen minutes, then strain into an open vessel, let it cool down to 100 deg. Fahr.: and mix four pounds of honey with it, and add one or two small cupfuls of hop yeast; cover up, and let it work for 24 or 36 hours. Skim off as often as scum rises; roast half a cupful of yellow sugar till it becomes brown, then dissolve it in water: add this to the beer to give color. Draw off into bottles or casks, and cork well. In two or three days it will be ready for use. This will make a delicious cooling drink for harvest time.

Queries and Replies.

REPLIES.

No. 3.—J. S., Upper Yarra, asks how he can make a frame hive out of a packing case? H. Naveau replies:—"It is very easy, but the best way would be to buy the frames and then get boxes according to the size. Kerosene cases are the nearest to the measure of the Langstroth hive lengthways, and crossways they just resemble the dimensions of the brood-room in the Berlephsh hive."

No. 4.—J. Simpson, Otway, asks what is the best food for bees and the way to give it them? I find, the best food for bees is candy made from moist sugar, and put it just under the quilt. I make it from 2½d. sugar. I put 4 lb. sugar in a white enamelled stew pan, and about a half pint water with it. I boil it in a gentle heat until the sugar begins to stick to the sides of the pan. Now I take it from the fire and put about a good handful of flour into it and keep stirring it in quickly until it is just right to pour out into a thin pan, which has been rubbed with grease or butter. Before it is quite set I run a knife through in parallel lines so that I can break in tablets when cold. The flour answers for pollen and the bees like it far better with flour in it than without it.

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OCTOBER 10, 1887.

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Editorial.

HINTS FOR NOVEMBER.

SWARMING will continue lively in many localities throughout November, and we repeat our caution to be *always ready* with tools, hives and frames, or clean new boxes. It is not every swarm that alights on a nice convenient bough or branch ready to be shaken into a box, but they sometimes settle in very awkward places and not unfrequently close to the ground, in which case arrange a box or hive over them by propping up, or as near as possible over them, and the bees will generally find their way in; a little coaxing and a gentle sprinkling of water will usually induce them to get under cover.

To take swarms from trees or other places too high to get at comfortably in the ordinary way, a light box, bag or basket on the end of a pole is handy; a bamboo pole is the best for it is so light. The Italian beekeepers have a bag made of a kind of cheese cloth, with wire or cane hoops to keep it stretched out, fixed on to a strong wire ring (like an angler's landing net) with a socket for the end of the pole to go in. The ring and bag are about 15 inches diameter, and the bag 30 or 36 inches long. When a swarm settles high this ring and bag can be hoisted and gently passed up under the bees till the bulk are within the bag, when by a jerk or push of the ring the swarm can be shaken into it, and, in most cases, secured easily and without much disturbance. If hives that have already swarmed twice cast another swarm, it is best to return it, for such swarms are generally small and unprofitable. Of course two or more casts of this kind can be united into a good strong stock, leaving the queens to settle the question of supremacy among themselves, unless they be in frame hives, when the beekeeper can save the spare queen, if he desires to do so, a proceeding that

is always wise to adopt. Careful and frequent attention will be required this month with regard to the honey from the spring flow, which usually slackens off early in December. It is not advisable to let it remain in the combs long after it is sealed as it gets darker and not so attractive to the purchaser as when extracted from the combs soon after it is sealed, when it comes out pale, clear and full of flavor.

Many beekeepers remove the outside frames of their hives as soon as the honey is capped along the tops of the frames and extract, replacing the combs at once. This course keeps the bees busy at work in the brood chamber, always giving room for storage as long as the honey harvest lasts, and also giving the queen an opportunity of increasing her brood nest if required. This plan has a tendency to prevent swarming also.

If working for extracted honey in the super, it is the best way to extract immediately a few upper rows of cells are sealed, replacing the same or similar combs at once. The honey may not be quite ripe, but it will rapidly ripen if kept in an open tank or barrel for a while. Where comb honey in sections is worked for, it is advisable to bestow a little attention to the supers as soon as the centre rows of sections are nearly sealed, it is advantageous to exchange them for the partly finished ones on the outside; you are likely to get better filled and better finished sections by this plan. If sections are filling quickly in a good locality, as soon as the bees are well at work in the whole of the sections, and the centre rows are wholly or partly sealed, tier up at once by placing another super with sections under the first super, so that you have your new sections between brood nest and the filled sections. In strong colonies this tiering up should be continued as long as honey comes in, even should there be 3 or 4 or even more supers on each hive.

If the locality is not rich, and honey comes in slowly but regularly, it will often suffice to remove centre sections as fast as they are sealed over, replacing them by new boxes with starters.

Keep a few queens in small hives or *nuclei* always ready to replace any that are lost, or that it is desirable to supersede for want of prolificness, or from old age. Queens that are getting old often produce a very large proportion of drones, and stocks with such a queen produce but little honey, and dwindle dreadfully by end of season. A young queen should be given immediately such a case is observed.

ANTS IN THE APIARY.

DIVERSE opinions have been expressed as to the damage or annoyance caused to bees by the numerous species of ants, and some declaring they are harmless, and others that they are dangerous enemies to the *genus apis*; the fact remains, however, that in Australia at least they are frequently a serious pest in the apiary, and difficult to be got rid of.

The little black ant not infrequently invades hives, being first attracted by sweets or the dust thrown out by the bees, and sometimes collect and domicile themselves in large numbers, especially in the early spring or late summer, in all probability tempted by the warmth. Sometimes they appear to be tolerated by the bees, but oftener the bees appear excited and annoyed at their presence. Wherever the black ants get into weak hives in numbers, their presence appears to prevent any improvement in the stock, the queen is sometimes found dead, perhaps killed by the tiny intruders, and not unfrequently the bees annoyed beyond endurance, swarm out. Regarded in any light whatever, black ants are most undesirable neighbors to allow about the apiary, and more especially near *nuclei* or other weak stocks.

The most troublesome and a somewhat formidable ant in the apiary is what is known as the sugar ant, a most intrepid and persistent robber of sweets, which it has the power of scenting from afar. This species travel long distances in search of food, and when a source is once found, immense numbers travel rapidly to and fro between it and their nest. Sugar, syrup, honey, treacle are their great delicacies, and once they find either of these it will require all the skill of man to keep them away. Beekeepers who are careless about spilling honey or syrup, or in dropping fragments of comb about the apiary are soon acquainted with these marauders. There are other varieties of ants which are troublesome in the apiary in different parts of Australia, but as the modes of preventing mischief by these two kinds of ants will generally be found effective for the others no special distinction need be made. It would be a matter of great interest

to apiculture generally, however, if beekeepers in various parts of the Australian group would report to us what kinds of ants are found to be troublesome or inimical to bees, and the methods, if any, found effective in preventing the mischief they do in the apiary, giving the name by which the ant is known, and if possible its scientific name also.

The sugar ants as soon as the warm weather commences go out hunting, and soon find out beehives, which they usually reconnoitre towards evening. As a rule the bees soon find them out, and drive them away from anywhere near the entrance, and have been sometimes seen to attack and carry them away. It is not often then that these ants are seen about healthy strong hives, although they will hang about and enter weak or diseased ones close at hand. We have frequently found them in considerable numbers sharing the food given to bees in the super, and if not stopped come in great strength and fight for the honey in the combs, and ultimately drive the bees out by force of immense numbers. They are very apt to do this with *nuclei* or the small hives used for queen rearing and fertilising, and we have frequently found the queens dead (evidently killed) and the bees all away.

Nearly all bee books place ants among the enemies of bees, but none appear to consider them in any way a serious enemy, and pass over the matter with a few general directions.

Some of the American apiculturists are now finding how mischievous ants may become in an apiary, and lately some of the bee journals have given every known method of destroying them or preventing them from troubling the bees, and as very few Australian beekeepers can entirely escape the ant pest, we propose in our next number to give some of the various plans that have been found successful. First we will speak of the best modes of preventing ants getting at beehives, and second the modes of destroying ants and their nests, or of driving them away from the apiary.

(To be continued.)

FOUL BROOD.

(CONTINUED FROM PAGE 52.)

WE see from Root's Gleanings in *Bee Culture* that in the recent unfortunate experience of this pest in his apiary in Medina, Ohio, he comes to the same conclusion as we do as regards the danger of transferring or shifting diseased bees from one hive to another, and believes that the plague is spread by bees from an infected hive getting into healthy stocks, which is almost sure to happen, no matter what precautions are taken, when a stock is disturbed and demoralised by shaking or brushing them from the diseased combs into a box or another hive either for *starring* them or to put them to comb building.

In Root's Gleanings for August he says (page 635), after describing the mode of making

proper solution of phenol (which is one part by weight of pure white crystallised carbolic acid in 500 parts of water), "after sundown open your diseased hive and uncup every single brood-cell of all the combs, whether diseased or not, with a wire brush or coarse comb. Be careful not to mutilate the larvae any more than necessary. You must rake the cells open, not strike the brush into them. With a spray diffuser, sprays a fine mist over the bees, brood, and the entire inside of the hive.

Be careful not to get too much on the bees and brood. By no means drench them, or you will either kill the bees or cause them to leave the combs and cluster on the outside of the hive. The robbers are then pretty sure to take possession and—you know the rest—your labor is for naught; nay, you are a great deal worse off than before.

I have tried yucca brushes to paint the combs and for spraying bees. I have tried using a watering-pot; but these drench the bees so that the results are apt to follow as I have described. The only thing that you can use with any degree of success is an atomiser. In three or four days after the first spraying, spray again, but do not uncup; and so on for a couple of weeks.

Now, my dear reader, I have given you full particulars in regard to the treatment of diseased colonies with carbolic acid. Although the acid treatment has so far been very promising, I am not sure that even that will be an ultimate success. Remember the point in its favor so far is, that it prevents the spread of the disease into other healthy colonies. I shall have something further to say about carbolic acid in our next issue, and also give the reasons why I prefer carbolic acid to salicylic.

In the *British Bee Journal* of 25th August (page 371), Mr. Simmins, in a letter which we give on another page, dwells on the importance of giving a diseased stock a new queen, young and vigorous, directly it becomes evident the disease does not rapidly give way before the ordinary treatment with phenol. He states he has numerous cases where, after the introduction of a new queen, the diseased cells have been rapidly cleaned out by the bees and the hive become healthy.

It is difficult to arrive at any theoretical conclusions about the treatment of this disease. We know that it is sometimes stopped by putting the bees into a clean hive and keeping them without food till all the honey they took into their sacs before leaving their old comb is consumed and then keeping them comb building on medicated syrup. Or simply putting them into a new hive with frames and starters of foundation and feeding either plain or medicated syrup, but we also know these plans sometimes fail, and we know further that stocks decidedly diseased get cured and clean without interference during a good honey flow. Some authorities tell us it is only a

disease of the brood, others that it affects the queen and mature bees, and that the eggs of the affected queens have the germs of the disease in them before they are hatched. Again Mr. Cheshires says he has never found any germs in the honey, and that therefore it cannot convey the disease, while numerous old and experienced beekeepers consider honey from an infected hive as the most certain vehicle for conveying contagion. More weight is given to the latter contention by the fact that it is found the phenol treatment is far more effective when all the honey in the combs is uncapped and thoroughly exposed to the action of the carbolic acid spray.

The success that has attended the changing of queens in the hands of many apiarists, coupled with the fact that queens are often found to be full of the disease germs, points to a possible reason why treatment without changing the queen so often fails, and as Mr. Simmins states so frequently succeeds when the change is made. This mode of treatment seems a rational one, and at all events, worthy of careful trial.

There is little doubt that this plague is more prevalent than we like to admit. There is scarcely an apiary we have seen entirely free from traces of it, that is, a diseased cell here and there; and there is also little doubt that in a great many cases where only such traces are present it goes no further, and all brood is perfectly healthy throughout, during the following breeding season. We have had stocks of our own in which there were distinct traces of this disease in the autumn. After breeding had ceased we found several cells still capped over, and have opened them with a splinter and drawn out the foul putrid brown substance, like rotten glue, unmistakable evidence of foul brood; but in the following spring all signs of the disease had disappeared and all the brood hatched out healthily and well. Still in some other stocks shewing the same signs in autumn the plague broke out immediately breeding was in full operation and rapidly developed into bad cases, some so bad that we made a bonfire of of hive, bees, frames, combs and all, after suffocating the bees over night with sulphur vapour; while others were put into clean hives with starters only in the frames, and left to do a little comb-building on short commons for a few days, and then fed freely with plain syrup. The latter are now strong and healthy colonies. Foul Brood can be kept in check with a little care and attention, and it is only when the beekeeper allows the disease to fairly take possession of his stocks that it becomes a difficult thing to cope with, and most probably ruinous to the apiary.

We believe the methods of treatment will have to be varied according to the season, the strength of the colony, the history of the stock and queen, and also according to the extent or virulence of the disease.

If foul brood appears in a good strong stock at the beginning or in the middle of the breeding season and good honey flow, and it shews itself by a few diseased cells among a much larger number that hatch out properly, it may be checked and probably cured by treatment, that is by disinfectants. After a fair trial of the medicated food systems we have found it in most cases unsuccessful and very troublesome. We, therefore, recommend the direct spraying of the whole of the frames and combs with 1 in 400 carbolic solution, or the solution of salicylic acid, and in order that this may be effective every suspicious cell should have its cap scraped off. The advice of Mr. Root to scratch cappings of both brood and honey is thoroughly good, especially if the diseased cells form a large proportion of the brood comb, for without removing or opening the caps the disinfectant cannot penetrate to the putrid grubs. It is a peculiar property of phenol, that if the slightest particle comes in contact with the putrid contents of the cells it rapidly dries it up to a mummy, all the disease germs and the foul odor are destroyed, and the bees soon clean out the cells. It will be seen, therefore, how necessary it is to open cappings to admit the phenol to the cells and their contents. Of course some of the healthy brood will be killed, but it is necessary to make a large sacrifice to cure or even check the disease. The above treatment should be repeated a fortnight after, and if the honey flow continues good all trace of the disease will probably disappear in three weeks after the first operation, but even after that every suspicious cell should be opened and sprayed.

This method will be found much more successful in spring and summer than in autumn, and in the latter season we prefer transferring the bees to a new hive, with foundation, and feed well with syrup, plain or medicated.

(To be continued).

APICULTURE IN ADELAIDE.

It is generally understood that South Australia is considerably in advance of other Australian colonies in the matter of apiculture, not only we believe as regards the number and size of apiaries, but also with respect to knowledge and experience in the industry, and a recent visit to Adelaide afforded us an opportunity of ascertaining to some extent, if such a conclusion was well founded.

In the first place, the Jubilee Exhibition now open was searched for exhibits of apicultural products, of hives and the various appliances used in the prosecution of the industry under the impression that an idea of the importance and extent to which beekeeping had attained would be in some degree represented in the great show in which, so far as could be ascertained, very few of the indus-

tries of the Colony had been overlooked. In this expectation I was not disappointed, and one of the first stands that arrested my attention in the main building was a splendid stand of ostrich feathers, the produce of ostrich farming in South Australia, wherein was shewn by photographs, &c., many of the most interesting phases of this industry from the first emergence of the chick in the artificial incubator up to the feather plucking stage. Close alongside this was a splendid show of comb and extracted honey from the Fairfield Apiary, belonging to Messrs. Coleman & May, of Mt. Barker, about 40 miles from Adelaide (of which a description is given by Mr. Alfred Sayer, on page 38 of the present volume). The great piles of well filled and clean sealed 1-lb. sections was a goodly sight, but the full Langstroth frames of comb, full of clear light-colored honey, every cell of which was sealed, the combs being so beautifully straight and even that the uncapping could be done by a machine, gave unmistakable evidence of an excellent bee locality and good management.

The comb-honey in several forms constituted the summit of the pyramid of nectar; the base was formed of packages of extracted honey, those in glass being bright and clean, of a pale amber color. The larger packages were tins holding probably from 20 to 60 pounds of honey.

I tasted some of the honey a few days after and found it excellent, soft, mild flavored, and delicious. I believe it is chiefly gathered from *eucalypti* on the mountain sides. Mr. Sayers states in his description of the apiary that the principal sources "are blue gum, *eucalyptus leucorylon*, and red gum, *eucalyptus rostrata*." The blue gum is *eucalyptus globulus* and does not, I believe, grow in the mountains near Adelaide.

The *E. leucorylon* is the iron bark, and this is the tree I believe which produces the honey I tasted. Messrs. Coleman's exhibit would have won a good place among the great honey exhibits in the late Indian and Colonial Exhibition where all the greatest apicultural countries in the British dominions competed.

The next beekeepers' exhibit I found was one by Mr. Walters of Flinders Street, Adelaide; this was also in the main building against the south wall and between the central and eastern entrances. The exhibit consisted principally of beekeepers' appliances and foundation with some fine samples of section and other honey. The case contained specimens of almost every one of the numerous tools and apparatus an enthusiastic beekeeper likes to have about him. What attracted my attention chiefly was the array of various kinds of Smokers, Bingham's, Doctor, Conqueror, Little Wonder, &c., Clarke's, Muth's, and other firms, all well and many excellently made. Mr. Walters has a factory in Adelaide which I subsequently visited and of which I shall have a few words to say presently.

In the Eastern Annex, among a very large and fine exhibit of ironmongery, I was surprised to find a lot of beekeepers' apparatus, notably extractors, solar wax extractors, uncapping tins, honey tanks, and swarm or drone traps made of all metal. These were exhibited by Mr. Simpson, the well-known ironmonger of Adelaide, and were as fine specimens of tinsmiths' work as one would wish to see, which, from subsequent enquiries, I found were also very cheap. The extractors were both two-frame and four-frame extractors, the latter with self-reversing frame-holders.

I subsequently found a rather large exhibit of hives and appliances in the Western Annex by Messrs. Dickens and Sons, of Wakefield Street, Adelaide. Here were hives of several patterns, chiefly of the Langstroth form, as adopted in Australia, with variously arranged supers, crates, &c. There was also a good assortment of capital smokers and other apparatus. Some extractors here are worthy of note, which I intend describing when speaking of Messrs. Dickens' factory which I visited subsequently to my inspection of their very attractive exhibit.

My intention was to visit many of the principal apiaries within reach of a day's journey from Adelaide, but after the first week, which was chiefly taken up with jurors' work, the weather became so wet and stormy that I had to content myself with seeing two or three apiaries only in the immediate neighborhood of Adelaide, concerning two of these a few words may be of interest.

The form of hive now almost universally adopted by South Australian beekeepers is the Langstroth, similar in all essentials to the form adopted in this colony, which we have styled the Australian Langstroth and described in these pages. There have been, however, many forms of hives in use among beekeepers in and about Adelaide, but I am informed they are now reduced chiefly to two, namely, the Langstroth and Dzierzon, or German hive, the former rapidly superseding all but this last, which is much in favor with some few beekeepers, and it was to the apiary of one of these (Mr. Wiedenhofer) that I paid my first visit. This apiary is situated in one of the suburbs to the east of the city in a locality where bees have a grand range over the park lands and gardens well covered with *eucalypti*. It is a house apiary, that is, all the hives are placed under a shed. This is a long low building open in front and partly so at back, closed at the ends, and from memory I should reckon it about 30 feet long, 10 feet broad (back to front) and from 7 to 9 feet high; it is paved with brick throughout. The hives are all of the Dzierzon form, some two and many three compartments or stories. These hives all open at the back, and the frames slide into the hive by means of grooves cut in the sides into which the projecting ends of the top bars of the frames fit

freely; the frames, therefore, hang crosswise in the hive or parallel with front and not parallel with the sides as in the Langstroth. In putting eight or ten frames into one of these hives the first one is pushed in close to the front, the second close up to the first, and so on, till all the frames required are in, when a frame with a glass panel closes in the compartment. As one cannot judge of spacing the frames, putting them in in this way, spacing nails are driven in each frame so that when all are in the whole series can be pushed bodily close up to the front without fear of crushing any of the bees. In removing the frames a special pair of tongs or pincers is used to grip the ends of the frames, and if one wishes to get any of the front frames all those in rear of them must of course be lifted out first. It is this particular fact in connection with the German forms of hives, both the Dzierzon and Berlepsch, which has been urged as a great objection, and our readers will remember a controversial correspondence in our pages upon this very point last year. For my part, having used both these forms, Dzierzon and Berlepsch, I have found no great difficulty if one uses the proper appliances and mode of working, still, all things considered, I prefer the Langstroth. Mr. Wiedenhofer showed me his methods of manipulation, and when he took his frame-box and tongs, sat down comfortably under cover in the rear of a hive, and lifted out ten frames one by one, placed them in his long special box, found the queen and replaced the frames, and not a bee disturbed or flying, I must confess he proved the hives could be as easily worked as he claims. Mr. Fiebig, another Adelaide apiculturist, had some stocks in this apiary, but the majority he had just moved to Kangaroo Island, where he intends carrying on the business of queen-rearing on a large scale. This Island has been set apart by the Government for the breeding of pure Italian bees, and the introduction of any but that variety of bee is strictly interdicted. As there are no native varieties of bees likely to interfere with the pure mating of young Ligurian Queens, it is very probable Kangaroo Island will furnish all Australia with a fine strain of Italian or Alpine bee. Some experiments in this direction made last year by Mr. Fiebig were, I was told, highly successful.

Another apiary I visited was that of Mr. A. E. Bonney, the well known apiarist and successful queen-breeder of South Australia. His apiary is situated in the suburb of Burnside, in a splendid locality, rich in desirable varieties of *eucalypti*, orange orchards, &c. At the time of my visit, early in September, Mr. Bonney was already extracting honey. The number of stocks in this apiary is not large, as Mr. Bonney devotes himself largely to queen-rearing, in which he adopts the miniature hive and methods of Alley, as given in his "Handy Book." Mr.

Bonney used the Quinby frame hive until recently, but in deference to the decision of the Association to adopt the Langstroth Standard he has replaced most of the Quinbys by Langstroths. In his queen-rearing operations he strives to obtain a strain that are pleasant to handle, hardy and prolific, and as far as I can judge of several queens I have obtained from this gentleman, he appears to have thoroughly succeeded.

There are several manufacturers of beekeepers' supplies in Adelaide, but I only visited two, viz., Messrs. Dickens & Sons in Wakefield Street, and Mr. Walters in Flinders Street. In the latter I was particularly pleased with a variety of excellently made smokers, mounted in a more finished and substantial manner than is usually seen. The hives are made on Mr. Chambers' principle, with dovetailed corners and carefully and strongly got up. Some simple and cheap extractors of an English pattern here struck me as very good; they have no multiplying gearing and the frame cages are arranged with segments of cylinders outside them, which prevent the thrown honey from splashing on the inside of the extractor-barrel, and producing the honey spray that with ordinary extractors covers the operator with a sticky dew. I saw a very convenient and well arranged solar wax extractor in this factory, and every conceivable requisite for the beekeeper filled the shelves. Mr. Walters has taken over the factory lately carried on by Mr. Leonard Chambers, who has now started a new establishment at 18 Franklyn Street, Melbourne.

The factory of Messrs. Dickens and Sons in Wakefield Street, Adelaide, was started during the current year, Mr. Dickens having carried on a similar business in England. In this factory, woodwork, blacksmithing, and tin-smithing is done, and nearly everything made throughout, on the premises. A steam engine drives saws, planers, lathes, grooving and section machines; good pine sections (4-piece) are neatly turned out, and the hives and frames (Langstroth's) are excellently made. Among the numerous appliances for beekeepers in this factory I noticed what was to me a new form of extractor, and which I consider has several very important points to recommend it, the chief one being in the form of rotating frame-holder. This consists of a complete cylinder, a little less in diameter than the outer case or barrel; the frames fit into this cylinder and lie against the ordinary net guard; about 4 inches of the bottom of the cylinder is made of fine wire net, as is also the base of the cylinder, therefore, in using the extractor, the honey is thrown from the comb on to the inner surface of the revolving inside cylinder, whence it drips down on to the wire net bottom, through which it is strained quite clear of

cappings and fragments of wax into the receptacle at the bottom of outer cylinder or barrel. The extractor has a close-fitting cover which altogether prevents any escape of honey spray when in operation. I saw several ingenious contrivances for beekeepers in the process of development in this factory which are likely to prove very useful. Any of our Victorian beekeepers who may visit Adelaide during its Jubilee time will find a pleasant and instructive way of spending part of their time in visiting these factories, as well as some of the well managed apiaries for which our neighbors are now famous.

Proceedings of Beekeepers' Associations.

VICTORIAN BEEKEEPERS' ASSOCIATION.

The fifteenth meeting was held at the Melbourne Athenæum, (Public Service Association Rooms), on Monday evening, the 8th July, the attendance was small.

The president stated he had received a letter from one of the members, Mr. C. J. Smith of Kyneton, suggesting that a section of a court in the Centennial Exhibition, should be, if possible, set apart for Australian apicultural products and appliances, and that beekeepers and beekeepers' associations throughout Australia should be invited to join in the undertaking.

The suggestion was considered an excellent one, but owing to the smallness of the meeting it was decided to postpone any action till after the matter had been fully laid before the members of the Association at the next meeting. The president stated he had already obtained the inclusion of apicultural products and appliances in the vegetable product section.

An exhibit of a frame hive, home made, from a kerosene packing case, and of a simple extractor made from a kerosene tin and a piece of common wire netting, were received from Messrs. Watt Brothers of Box Hill. These were sent to show how both an useful frame hive and extractor could be constructed from cheap material almost always available in any part of the country.

The president stated he would keep these at the Observatory for the inspection of any desirous of seeing these specimens of cheap beekeepers' apparatus.

The sixteenth meeting of the Victorian Beekeepers' Association was held at the Public Service Association's Rooms, Athenæum, on Tuesday, the 27th September, 1887. Mr. Ellery, president, in the chair. Mr. Leonard Chambers was duly elected a member of the Association. A discussion arose upon the best method of securing the co-operation of beekeepers

throughout Australia and New Zealand, towards a combined Australian apicultural exhibit in the Centennial Exhibition in Melbourne next year. The president stated he thought there would be no difficulty in obtaining ample space for the purpose if an early application were made, but that it was desirable that the probabilities of co-operation from other colonies should be ascertained beforehand. He considered it would be much better for beekeepers to send their exhibits to be placed in one large apicultural section or court, rather than spread about as small exhibits in their respected colonial courts where it could scarcely be expected they would command such attention as they would do if exhibited in one large group with each particular exhibit however, quite distinct. On the motion of Mr. Fullwood it was resolved that the Beekeepers' Associations of New South Wales, South Australia, and Queensland be written to by our secretary, inviting them to co-operate and help in gathering together a representative Australian apicultural exhibit for the Melbourne Centennial Exhibition next year, and that each association be asked to take such steps in their respective colonies as may seem best to them to induce beekeepers and manufacturers of beekeepers' supplies to forward exhibits.

A discussion also took place on the various methods of queen introduction, several members testifying to the unvaried success of the methods, and especially Alley's, where queens were placed in the strange colony in a cage whose exit was stopped up with food made of a stiff paste of flour, sugar and honey. The bees quickly eat away the food, freeing the queen who was always well received. The president stated he had introduced seven virgin queens without losing one last season by this method. The question of the treatment of foul brood was also discussed; some of the members were of opinion that treatment was of little use unless the queens were changed for young ones known to be healthy. It was pointed out that phenol treatment appeared to be most successful when the combs affected were sprayed with the carbolic solution of Cheshire after scratching away cappings of both brood and honey. One member suggests a *file brush of steel wire* as a very suitable tool for scratching the cappings off.

Mr. L. Chambers exhibited some Heddon's honey boards and Alley's miniature hives, showing his method of dovetailing the parts of a hive together.

The meeting terminated soon after ten o'clock.

The best honey weather is when it is warm and moist, when the air is full of electricity and a storm approaching.

Original Contributions.

THE USE OF COMB FOUNDATION.

Mr. Heddon and some other American beekeepers state that if starters only are used in frames, they should never be more than $\frac{3}{4}$ of an inch wide, or there will result crooked combs, either very narrow starters ($\frac{1}{4}$ of an inch) or full sheets. If 2 or 3 inch starters are used, they are sure to stretch on the free edge and buckle in all directions, resulting in all the annoyances of crooked and uneven combs.

For section boxes thin foundation must always be used, but whether we use simple starters or full sheets seems almost a matter of choice. We find small triangular starters do just as well as full sections, and we believe we get sections more evenly built this way. With the sections nearly full of foundation, we find it often buckles up and the section is filled very unevenly with holes through in several places, while sections with starters only are nice and evenly filled with cells an equal depth on both sides the septum.

Correspondence.

FASTENING FOUNDATION TO WIRED FRAMES.

No. 49.—I think all who are interested in beekeeping, and have tried the new way of fastening foundation by electricity to wired frames, will feel thankful to Mr. Ellery for introducing it. It is so simple and so perfect that if once tried will give every satisfaction. I have been wiring some frames and filling with foundation, and it gave me much pleasure to see how well the work was done, and how firmly the wires became embedded in the wax. The old way could only press the wire into the foundation, while in the new the wires become heated by the electricity and gradually melt the wax, which after cooling is firmly set around the wires. I do not think we shall succeed without wiring the frames, as the heat in the honey seasons is so great as to keep the combs quite soft, and the least jar with the weight of honey will cause them to break; and in extracting, if the combs are exposed to the sun for a moment or two, it will break; but if the frames are wired and the foundation firmly fixed, they can be used in any weather and will stand rough handling.

July 8, 1887.

WILLIAM DARR.

CYPRIAN BEES, &c.

No. 50.—When last season my Cyprian bees arrived from Mr. Frank Benton, I was somewhat disappointed, but now since one of the most disastrous winters to bee life in the Western district of Victoria has passed away, I am enabled to say something in their favor

Never since I kept bees, which is now more than 32 years, have I lost so heavily. The greatest losses however by far in this district were sustained among the black or German bees and hybrids. Strong hives which in autumn fully covered eight frames, are now just alive betwixt two. But I am not the greatest loser after all, for I know some older beekeepers than myself who have lost 70 out of 90, some 20 out of 25, and others everyone. The pure Italianseame well through the winter, but the Cyprians the best of all. They seem to be far more hardy than any I have yet seen, and although they are not quite as easy handled as the Italians, yet they have one great superiority, there is no sickness among them, and this is worth a great deal. Some of the Italians are very tender, and whenever we get weather which continues to be damp the latter suffer severely from diarrhoea. I have been trying of late to feed the bees with moist sugar on Mr. Simmins' plan, but find it does not answer very well, for some of it gets wasted, falls down between the frames, and as soon as it becomes soiled or otherwise proves to be obstructive, it is removed out of the hive; but not so with the candy, particularly with that which is made from moist sugar with a small addition of flour. I have been using a great deal lately, where I have put as much as 3 ounces of flour to every pound of sugar, and I find that the bees are very fond of it, and do not waste any, and then it is so handy, one needs no feeder but simply to push it under the quilt. There is another very important matter which ought not to be lost sight of, and it is this—I fear many inexperienced “beekeepers” will make this mistake, that when they inspect their hives on a cold day, they will find their bees in a state of dormancy, and think they are really dead, when they are only so in appearance. Bees in this state I remove indoors, close the entrance with a piece of perforated zinc, lift the quilt, sprinkle them with a little sugar, put the quilt on again and place them in a warm room, and in less than half-an-hour they mostly rally; then I give them a feed of syrup, and keep them indoors until I get a fine day, when I remove them to their old stand, and with careful attendance they get on all right. Of course, if left in their state of dormancy they will inevitably meet with their death.

H. NAVEAU.

Hamilton, September 30, 1887.

No. 51.—In your last issue of the Journal (long may it continue giving such information) you published an article upon fixing foundation into wired frames by means of a galvanic battery. After reading it, I applied to two dealers in electrical appliances, and they each informed me that a half-gallon battery would not have the desired power. One of them offered me a battery at a cost of

50s., that he “thought might do it, but would not guarantee.” However, feeling sure you were right, I set to, to make one; and following your instructions closely, the result more than fulfilled my expectations. You say that “if in good order the battery should make half an inch of wire red hot” I find that mine will do so to a full inch when first started working, the cost being not more than five shillings. Up to this time I have been using an Easterday’s fastener, but until something better (if there be such) turns up, I shall pin my faith to the battery, and only use the fastener as a makeshift. Should you care to publish this, and any subscribers to the Journal wish to get a description of my battery, I shall be only too pleased to give it to them; or they could inspect it any evening or Saturday upon application to

THOS. DEAN.

Brighton.

Extracts from Foreign Journals.

OUTLINES OF BEEKEEPING FOR BEGINNERS.

From British Bee Journal.

(CONTINUED FROM PAGE 57.)

XI.—HOW TO PUT A SWARM INTO A HIVE.

1. The bees which leave the hive to swarm fly out in large numbers, thousands of them wheeling about in circles so that the air seems alive with bees. They soon settle, usually on some bush or tree at a short distance from the hive, and form a cluster, which grows larger and larger as the straggling bees join it. As soon as most of them have settled and become quiet, the swarm should be placed in a hive, or it will of its own accord seek a home and be probably lost to the beekeeper, as under such circumstances bees will sometimes fly a great distance before they settle again.

2. If the queen does not join the bees when clustered, they return to the old hive. They will also leave the hive if the queen be not secured with the bees when the swarm is hived. Sometimes swarms do not seem inclined to cluster; and if the beekeeper sees that they rise higher and higher into the air, he should endeavor to stop their flight by throwing water from a syringe over them in such a way as to resemble rain. This will generally have the effect of making them settle at once.

3. If the bees have settled on a bush near the ground, sprinkle them with cold water from a garden syringe and close clustering will be the result. Spread a cloth under the cluster, and at one end place a floor-board, bringing the end of the cloth over the edge of board and place the hive on it with the front, as near as possible to the cluster, propped up about one and a half inches by means of a stone

or block of wood. With a sudden jerk dislodge the bees on the cloth in front of the hive, which they will quickly enter.

4. If the branch on which the bees have clustered is small and not valuable, cut it off, taking care to avoid all jarring, and shake the bees on to the sheet in front of the hive.

5. If the bees have clustered on the branch of a tree too valuable or too thick to cut off, shake them first into an inverted skep. Hold the skep bottom upwards in one hand under the cluster, and with the other give the branch a smart shake so as to let the bees fall into it. If they are to be kept in the skep put a floor-board over and turn the skep on to the stand the bees are to occupy. If they are to be put into a frame-hive invert the skep and with a sudden jerk throw the bees down on the cloth close to the front of the hive.

6. If they alight on the trunk of a tree brush them gently into a skep, or, if possible, place its edge near the upper part of the cluster and drive them up by blowing a little smoke, or placing a cloth dipped in carbolic solution under them. A piece of comb containing brood fixed inside the skep will induce the bees to take to it more readily.

7. If the bees settle on the ground, the hive should be set close to them, and with a spoon gently place a few near the entrance. The hum of these will entice others to follow, and in a short time they will all enter.

8. If moveable comb-hives are to be used it is best first to secure the bees in a skep or a metal pail, from which they can be poured out gently on to the cloth in front of the hive.

9. In moveable comb-hives with legs, turn up the quilt and remove three or four of the outer frames, and from the pail pour out the bees into this space. They will run in and cluster among the other frames: then return the frames which have been taken out and lay the quilt gently over them, leaving a small opening at one corner for the straggling bees to enter. Put on the cover and prop it up to allow free ventilation until the evening, when it can be put in position.

10. The bees should be taken to the stand which they are to occupy as soon as possible after they have been hived, and should be shaded while they are in the receiving hives or skeps from the heat of the sun.

11. Despatch in hiving is important as bees become more difficult to handle the longer they are out of the hive, and there is a danger of their rising and flying away.

12. If the bees are to be kept in a straw skep it will require no preparation, but should be perfectly clean. Frame-hives will require the frames furnished with guide-combs or comb-foundation, and when they are propped up during hiving care should be taken to have the frames hung at right angles to the front, otherwise the heat and weight of the bees would displace the comb foundation, and they might possibly break away from their attach-

ments. Great care should also be taken in moving these hives when the swarms are in them, and they should be carried very steadily and held level. The hive should be adjusted in its place, taking care that it is level across the combs.

XII.—HOW TO TREAT RECENTLY-HIVED SWARMS.

1. The careful beekeeper will endeavor to get his swarm to build out its combs and fill the hive as quickly as possible, and he will not leave the bees to do so without any assistance from him. Feeding gently will have the effect of keeping many bees at home comb building who would otherwise be in the fields collecting. All swarms should be fed, even in fine weather, for the first week at any rate. At the time of hiving, give them a bottle of syrup, placed on the top of the frame in such a manner that they may have access to two or three holes in the feeding-stage. A hole must be cut in the quilt to allow the stage to be placed over it, and care should be taken to cover over the bottle so that strange bees cannot get at it from outside, otherwise robbing may result.

2. The syrup used should consist of 10 lbs. white lump sugar, 7 pints of water, 1 oz. of vinegar, and 1 oz. of salt, and the whole boiled for a few minutes, after which 1 oz. of salicylic acid solution should be added. This solution may be made by dissolving in 1 pint of warm water $\frac{1}{4}$ oz. of salicylic acid and $\frac{1}{2}$ oz. of soda borax.

3. The swarm should only have as many frames as it can comfortably occupy, the space being closed up with a division-board, and the spare frames hung in the division at the side. From six to eight frames are usually sufficient.

4. Swarms are greatly assisted by having given to them one or two frames of comb with hatching brood. These can be taken from established stocks if the beekeeper have them, and they be strong enough to spare any.

5. At the end of a week, examine the hive, and if the combs are built out, put in a couple more frames. Add frames as soon as the bees require more room until the hive is filled with combs.

6. The first consideration of the beekeeper should be to make sure worker-brood is being raised. If during the examination the queen has not been noticed, and the combs are not found to contain worker-brood, if possible, without delay, place in the centre, amongst the combs, a frame of comb containing eggs taken from another hive. Should the swarm have lost its queen, royal cells will be at once started. Should only drone-brood be found, the queen must be removed, and the bees should be united to another swarm having a fertile queen.

7. In ordinary seasons the beekeeper will have to be contented if a young colony fills its hive with comb and collects enough stores to carry it through the winter without his assist-

ance. In bad seasons it will be necessary to supply the bees with most of their winter provisions, and only in very good seasons can he expect to get any surplus honey.

XIII.—HOW TO MAKE AN ARTIFICIAL SWARM.

1. If, during the month of May, honey being abundant, a stock hive is found crowded with bees containing drones, and is not inclined to swarm naturally, not having therefore commenced queen-cells, it can be *swarmed artificially*.

2. Prepare a hive in the same way as for natural swarms, that is, hang it in frames furnished with guides or comb foundation. If there are frames available containing empty combs, so much the better, as these can be used to advantage.

3. If an artificial swarm is required from a straw skep, it may be obtained by *driving* the bees. Remove the skep containing the stock to some quiet spot, turn it bottom upwards, and stand it in a pail for convenience. On the old stand place an empty skep. On the inverted stock put an empty skep, bringing the edges together at the point towards which the combs run. Push a skewer through the edge into the lower hive so as to form a sort of hinge, and support the upper hive by means of a couple of stout wires bent at right angles at either end. Stand in front of the opening with back to the strongest light and commence rapping on the sides of the lower hive with open hands hard enough to jar the combs, but not so hard as to run any risk of breaking them from their attachments. After a few raps, which must be kept up regularly, the bees will commence their ascent to the empty skep.

4. As the driven bees ascend a sharp lookout must be kept for the queen, and after she is seen stop the driving when about half the bees have left. Remove the swarm and the stock, and place them on the opposite sides of the old stand, with an interval of about 3 feet between them. The bees in the skep placed on the old stand can be shaken out in front of the swarm. If the stock or swarm appear too weak, either would be strengthened by bringing one nearer to the old stand, moving the other further away.

5. If the queen be not found during driving, the bees should be returned and another attempt made. Care must be taken to leave sufficient bees in the stock to nurse the brood and build queen-cells.

6. The driven swarm can be placed in a moveable comb-hive, if the beekeeper wishes to do so, prepared as recommended above (2).

7. If the beekeeper has one colony in a frame-hive, and wishes to make two, he must take a comb of brood and bees on which the queen is found, and place it in a hive, filling this up with empty combs or frames with guides. Then put it on the stand where the stock stood, and remove this to a new position.

Insert an empty comb at the side of old stock, bringing the other frames close together. The bees on the wing will return to the old stand, join the queen, and form the swarm.

8. Artificial swarms should be made when the weather is fine, and many bees flying, and should always be fed. As most of the old bees will leave the old stock, this should also be fed, especially if it be short of stores or the weather bad.

9. Care should be taken not to multiply colonies too fast, by making many swarms. *Aim at having a few very strong colonies, rather than a large number of weak ones.*

WORKING FOR EXTRACTED HONEY.

From the American Apiculturist for July, 1887.

Just at the present time there seems to be a "craze" among beekeepers on the subject of comb-honey production, many who have heretofore worked almost exclusively for extracted honey changing their tactics and are now advocating and talking comb-honey to the exclusion of that which they formerly endorsed. I fear this is not a wise policy, for it can only result in soon lowering the price of comb-honey and advancing the price of extracted, this causing an expensive changing of fixtures the second time. It seems to me that the well balanced apiarist should produce both comb and extracted honey, and as he sees the tide swaying toward the side of the one he should go a little heavier in the opposite direction, but not enough as to throw aside all his fixtures along the line the tide is moving. We have many farmers in this locality who when mutton and wool are low sell out their sheep for a song and go into the so-seeming more profitable business of beef and butter, paying a high price for cows in high tide, for everything in the cattle line. In a few years times change, and cattle are at low tide; beef and butter are sold for a song, while mutton and wool are now bringing a good price again. These farmers now for a second time become discontented and change their cows for sheep, only at a great loss again. So they keep on doing in a sort of will-o'-the-wisp chase losing money at every change. Others keep both sheep and cows, never running out of either, but in time of good prices with the flock raise a little more from the sheep, and these again increase the herd when high prices are paid for the production along that line. In this way a steady growth is maintained, while by the other plan a downward tendency is a sure result.

As I have worked for years for both comb and extracted honey and believing that the present time is favorable for the production of more extracted honey and best comb, perhaps I cannot do better than to tell the readers of the *American Apiculturist* how I proceed to accomplish what seems to me to be the best

results. The first thing necessary in the successful production of extracted honey is a good queen to produce hosts of workers to gather the harvest. In fact, whether all realise it or not, the whole of beekeeping centres in the queen. Without the queen it would be impossible to produce a pound of extracted honey, hence it becomes apparent that the better the queen is the more honey we obtain. When all come to realise the great value of really good queens we shall have taken a long stride toward successful honey production. But good queens are only of value when we surround them with favorable circumstances, thus getting large numbers of eggs laid at the right time and causing each egg to be nourished to a perfect bee, so that we can have the bees in our colonies by the tens of thousands at the right time. Failing in this, the flowers will bloom in vain as far as filling our surplus combs with honey ready for the extractor, is concerned.

But "what are favorable circumstances" is asked, to which I reply, an abundance of food and warmth. The abundance of food is quite easily secured in this day of bee-feeders, and especially so, if the apiarist has set aside the previous season, as he should, combs solid with honey which are ready to be set in the hive at any time. But the warmth is not so easily secured, especially when our honey harvest comes early from white clover which requires the getting of a large quantity of eggs laid early in the season in order to have the bees in time. Several years ago I tried artificial heat to help forward things, but after numerous experiments, which resulted only in harm, I gave it up.

About this time (1878, I think it was) J. H. Townley, a then noted beekeeper of Michigan, came out with his chaff packing, claiming that there was heat enough generated by an ordinary colony of bees to promote safe, early breeding if said heat was not lost by radiation. He claimed, if I remember rightly, that this chaff packing answered the same purpose to the bees which bed quilts and coverlids do to a man, in which case if a man is "covered up warm enough," as the expression goes, he would be as warm in a zero temperature as in June. This looked reasonable to me and after that I set my bees when taken from the cellar into chaff hives or rough boxes filled with chaff, sawdust or cut straw, always contracting the hives with chaff division-boards, quilts, &c., to suit the size of the colony. In this way colonies of bees would go right on breeding through cold days and nights, keeping warm and nice till the combs would be full of brood down at the bottom corners, while those not protected would be clustered closely to keep warm, with very little brood. I here give credit to Mr. Townley for this plan and think all using it would be willing to do the same.

As soon as all the combs are filled with brood, which were first given them, more are added till the hive is full of comb and brood. In adding these combs, I prefer to add two at a time, using one which is empty and one filled with honey such as spoken of above. The empty one is placed at the outside and the full one in the centre. Before putting in the full one I break the cappings of the cells by passing a knife over it flatwise, for by this means the bees are obliged to remove the honey, and in doing so are stimulated to apparently greater activity than by any plan of feeding with which I am acquainted. As the honey is removed over to the outside empty comb, the queen fills the emptied comb with eggs which when hatched into larvæ require the honey brought back by the nurse bees to feed said larvæ, and as the honey is now being carried again, activity is still kept up and the queen now goes over and fills this comb with eggs also. In this way one hive is soon filled with eggs, brood and bees just in time for the harvest.

Having the hive filled as spoken of, and the honey harvest at hand or just commenced, if we wish no increase from our bees, no time is to be lost in putting on the surplus arrangement, otherwise the bees becoming crowded may get the swarming fever. For extracting I prefer another hive of the size of the first, but some prefer one of only one-half the depth. As to results there is probably no great difference, but I consider it quite an object to have all hives and frames alike in the apiary. In putting on this surplus arrangement I prefer to use empty combs, if possible, instead of comb foundation. I also prefer to use two large or wide dummies, one at each side, for a few days, so that one-half of the room is taken up which leads the bees along gradually instead of thrusting a large amount of surplus room upon them at once. From experience I believe them less liable to swarm where this course is taken, for they seem to bend every energy to fill this small, additional room, while, where a large amount is given at once, they are injured should it become cool; or, if warm, they swarm from being loath to enter it. As soon as the half of the hive given them is partly filled with honey, the dummies are taken out, the combs spread apart and frames filled with foundation put between them. At this stage I would just as soon have foundation as empty comb, for the bees are now ready to work upon it, while before they were not. The time for taking out the dummies is when you see the cells being lengthened out with new comb along the tops of the combs.

Now you will proceed in the future depends upon whether you wish your honey all ripened in the hive till the harvest is over, or ripened in a warm room by evaporation. Sometimes I think that honey left on the hive through the season is of a better quality than that

extracted every week or so; then again I am not so sure about it. Of one thing I am certain, more honey can be secured with less hives and fixtures where it is extracted when the bees first begin to seal it, than can be gotten by the other method.

As to the labor there is little difference, except that when we extract often the labor comes at a time of year when we are the most crowded. To be sure the operation is gone through with oftener, but to offset this, there is little or no uncapping to be done, while the honey leaves the comb more clean with less than one-half the labor in turning the extractor. If the season is warm and dry I would just as soon have honey extracted as above, as that left on the hive the season through, but if cool and damp I prefer it ripened all that is possible by the bees, and even then it is not as good as the other. In my opinion the season has more to do with the quality of the honey than the process of ripening. If we decide to extract oftener, the hive we have already added (if both contain two thousand or more cubic inches) is probably all the room the bees will need, but if left on during the season, one more and probably two will be needed. In putting on the third story I do not use the dummies, for by this time the weather has got so warm and the bees so numerous that they will spread out so as to occupy the whole of the extra hive. This hive should be put on when the bees have the combs in the second story sealed along the tops of the frames, or soon after you would commence extracting if working the other way. Many say raise up the second story and place this third hive between the two; but after repeated trials of both I prefer placing it on the top for I think the bees will occupy it just as quickly if the honey flow continues, while if it from any cause should be cut off at this time or soon after, we are in much better shape in not having the honey scattered through the three hives with few if any combs full. If a fourth story is needed, put on the same as the third, when after the season is over you will begin to carry the honey to the honey house and extract.

To get the honey off I find it is the best way to go to a hive and blow a perfect deluge of smoke down on the bees from the top of the combs, and as soon as the bees have run below take off that story and set it on your wheelbarrow or honey cart, not attempting to get more than one story from one hive at the same time; for, if we do, the bees will return to the next story before you can get it off, when smoke is of little use to drive them. Before extracting save plenty of good, full combs for wintering and spring feeding. If the weather is cool, when you wish to extract, place the combs of honey in a small room for three or four hours previous, in which the temperature is kept as warm as 100 degrees, when you can take them out as you wish to uncap and

extract them, doing this work as easily as on a hot day in July or August.

In the above I have given a brief outline of how I work for extracted honey, and as a proof that it is an average plan at least, will say that I have taken as high as 500 pounds of honey from a single colony in one season.

In conclusion I will say that the getting of multitudes of bees, just at the right time, has more to do with the successful working for honey than anything else, and when all realise this and work for the same to the fullest extent, one-half of the colonies will gather as much surplus as the whole do under our present management.

Borodino, N. Y.

AN EXPERIENCE WITH SWARMING.—On 14th October three hives swarmed within ten minutes of one another, one first, and two second swarms; they all united in one cluster, and were all hived in one hive. Two hours after they swarmed out, and separated in two swarms, but quickly united again, and were hived as one swarm. In half an hour they sallied out again, and re-entered the hive from which the prime swarm issued, leaving a queen, and a handful of bees only, in the hive they had been placed in. *Query*—Which queen returned to old hive, and if one was destroyed, was it probably the oldest?

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VOL. II.—No. 6.]

NOVEMBER 10, 1887.

[PRICE 6d.]

Editorial.

REPORTS WANTED.

OUR readers are reminded that we are very desirous of obtaining reports from the country on the progress of apiaries, the prospects of the season in different localities, accounts of honey-yield from various plants, of how bees are doing, and indeed any news, incidents, or gossip about bees and beekeepers, however brief or simple, will be welcome and will be made use of in the number following. We want to know whether increase by swarming has been as great in various localities as it has been in particular ones—whether any loss is occurring from disease, if there have been good yields of honey in particular places, and whether such yields have come from gum trees, clover, or whence. We must ask our readers and their beekeeping friends to be a little communicative and supply us with bee news from the country.

HINTS FOR DECEMBER.

So far the bee season, in the southern parts of Australia at least, appears to have been promising, and the honey-flow abundant; but it must be remembered that in South Australia, Victoria, Tasmania, and a large part of New South Wales, we have to look forward to a more or less complete cessation of the harvest during a period beginning about the end of November or middle of December, depending on the locality and prevailing weather, until the *eucalypti* and autumn flowers afford another flow which sometimes commences as early as January, but whose richness depends greatly on the season and state of weather. Now it is when a good honey-flow begins to fall off that the beekeepers' chief trouble commences—cross bees, robbing, fighting, weak colonies getting demoralised, loss of queens,

reappearance of disease which apparently vanished during the flush of the harvest.

Robbing and attendant fighting are difficult troubles to cope with when once started at the cessation of a honey-flow, but as it is usually induced by some carelessness on the part of the beekeeper, it is in most instances more easily prevented than cured. Leaving pieces of honeycomb or spilling honey or syrup about the hives or using leaky outside feeders are common ways in which robbing is first brought about. Opening hives in the middle of a warm day, when no honey is coming in, is also a sure incentive to robbing, and when once a commencement is made the whole apiary often joins in the havoc. Feeding honey instead of syrup will often start robbing, and for this reason as well as many others we always recommend syrup for food and not honey. If robbing is found to have set in, vigorous action is necessary or many of our colonies soon get ruined. Various plans are suggested, all of which appear to fail sometimes.

Contracting the entrance so that only one or two bees can enter at a time is recommended, but if it be warm weather this interferes seriously with ventilation, in which case the whole entrance may be covered up with wire net with the necessary bee-way cut out. This will limit the entrance without interfering much with the supply of air to the hive. Another way is to lean a sheet of glass against the hive in front of the entrance so that the bees cannot go straight in or out, but must pass out right or left of the glass, and then stop up one side way so that the bees can only get in or out at one side: this is often rapidly effective. A piece of calico tacked from alighting board to front of hive so as to hide the entrance, and damped with a little carbolic acid and water has also been found thoroughly successful by many beekeepers. Throwing a wet sheet over a hive and keeping it on till

near nightfall, and replacing it next morning for a second day, is generally successful where other courses fail. If only one stock is robbing, and it can be identified, changing the places of robber and robbed for a few days soon settles the matter.

Cross bees require plenty of smoke, and even then they remain cross if they have little or no honey in the hive, in which case a little sprinkling of syrup or sweetened water before smoking has a magical effect. It is a great mistake to use too little smoke when we wish to quiet bees. A good cloud into the entrance and then a thorough good deluge under the mat and over the frames, decisive and overwhelming, is the proper course. Continually puffing from a half-lighted and almost smokeless smoker is a sure irritant of even quiet bees. While speaking of this I may mention that I find that dried eucalyptus bark—especially the stringy kinds—broken up small, is capital fuel for a smoker; the smoke is aromatic and carries a little of the essential oil of the *eucalypt* with it and will, therefore, act somewhat as a disinfectant.

Late and weak swarms, *nuclei*, and stocks not thoroughly established, should be fed freely immediately honey gets scarce, so that they may be built up for the autumn harvest. No better food can be given than white sugar syrup with a little salt in.

Outside frames of strong stocks, if well filled, should be extracted, care being taken that plenty is left to keep the bees going, or if close extracting is resorted to, regular feeding must be carried on till honey begins to come in again.

FOUL BROOD.

(CONTINUED FROM PAGE 70.)

SINCE writing our last article on this subject, we have had the pleasure of finding that several stocks which were treated late last season, and very early in the present one, by transferring to a new hive, and frames full of foundation, and feeding with syrup medicated with salicylic acid are now apparently the best stocks in our apiary. Every one has sent off a grand swarm, and both parent stocks and swarms are overrunning with bees, and storing honey rapidly. The disease is at all events checked, and if it does not re-appear after our first honey-flow is over, by the middle or end of December, we may conclude it is cured.

We have seen some hives in the country which had lost nearly all their population from moth (as we were told); the owners knew it was moth from the "chips" or "scales" of wax which were found about the entrance. On examination foul brood in its worst phase was found in every hive, and the wax chips thought to be a sign of the ravages of the moth, were the cappings of the honey cells gnawed off by robber bees, which, doubtless, conveyed the disease to their own homes. We

believe that the wax moth cannot get a foothold in healthy colonies, and that when it is found in a hive, it is after the hive has been decimated by disease, starvation or queenlessness.

In a late official report, the United States Entomologist, Mr. N. W. McLain, devotes several pages to the important subject of Foul Brood, an extract from which is given in *The American Bee Journal* of August 31, headed "The Foul Brood Disease." This article is important and exhaustive, and is worthy of perusal.

Mr. McLain adopts the following treatment, and reports of its undoubted and remarkable success in several apiaries, numbering from 14 to 200 colonies. First he prepares a mixture for spraying the combs; this mixture is made as follows:—To three pints of water add a pint of dairy salt (any ordinary good salt will do), warm this gently to about 90 degrees Fahrenheit (nearly blood warm) till all the salt is dissolved. Now take a pint of boiling water and dissolve four tablespoonsful of bi carbonate of soda in it, stir these two solutions together, and while doing so add enough honey to thoroughly sweeten but not to thicken it. Then dissolve $\frac{1}{4}$ of an ounce of salicylic acid in about a fluid ounce of alcohol, and stir this into the mixture also; leave it standing for two or three hours, when it will settle and become clear. He goes on further to describe the treatment as follows:—Shake the bees from the combs and extract the honey as clearly as possible. Then thoroughly atomise the combs, blowing a spray of the mixture over and into the cells, using a large atomiser throwing a copious spray; then return the combs to the bees. Combs having considerable quantities of pollen should be melted into wax and the refuse burned. If there is no honey to be obtained in the fields, feed syrup or the honey which has just been extracted. If syrup is used, add 1 ounce of the remedy to each quart of the syrup fed. If the honey is used, add $2\frac{1}{2}$ ounces of the remedy to each quart of honey fed. The honey and syrup should be fed warm, and the remedy thoroughly stirred in, and no more should be furnished than is consumed.

Give all the colonies in the apiary one copious application for the remedy, simply setting the frames apart, so that they may be freely exposed to the spray. This treatment frequently reveals the presence of disease where it was not before possible to detect it. The quantity prescribed, applied by means of a large atomiser, is sufficient to treat 150 colonies. Continue the treatment by thoroughly and copiously spraying the diseased colonies at intervals of three days, simply setting the frames apart so as to direct the spray entirely over the combs and bees. In order to keep the bees from bringing in fresh pollen, burn old dry bones to an ash and pulverise in a mortar, and sift through a fine wire cloth sieve,

and make a mixture of rye-flour and bone-flour, using three parts of rye-flour and one of bone-flour, adding enough of the syrup or medicated honey to make a thick paste. Spread this paste over part of one side of a disinfected comb, pressing it into the cells with a stiff brush or a thin honey-knife, and hang this in the hive next to the brood. Continue this treatment until a cure is effected. Keep sweetened brine at all times accessible to the bees, and continue the use of the rye and bone flour paste while the colonies are recuperating.

As a preventative apply the remedy in the form of a spray over the tops of the frames once every week until the disease has disappeared from the apiary.

Mr. McLain says further that "all the evidence so far obtained seems to prove that pollen is the medium through which the contagion is commonly introduced, and by which it is communicated to both bees and brood."

In our report of the proceedings of the South Australian Beekeepers' Association on page 86, will be found a very useful and valuable paper on Foul Brood and its treatment, read at the last meeting of the Association by E. Clough, Esq., of Mt. Barker, South Australia, which our readers will find worthy of careful perusal.

(To be continued).

ANTS IN THE APIARY.

(CONTINUED FROM PAGE 68.)

We believe that strong healthy stocks are seldom troubled with ants, and although they may sometimes be seen reconnoitering about a hive on warm evenings they soon appear to be convinced that no business is to be done, and none will be again seen around that hive during the summer, but they soon find out every colony that gets weak or demoralised. Numerous devices are resorted to to prevent ants getting on or in the hives, and most of them require that the hives should be raised at least some eight or ten inches from the ground. The most economical way is to keep the hives on a range or bench supported by two legs at each end—such a range may be made of common 2in. x 3in. scantling or hardwood quartering. A range or bench, eight feet long, will carry four to six hives, and the legs or supports may be from eight to sixteen inches high. To keep the ants from this range the four legs should be made to stand in four tins (jam or preserve meat tins or anything of the kind will do), fill these tins with water, on top of which a little kerosene should be poured to prevent evaporation. So long as the tins are kept clear of leaves, dirt and weeds and filled with water, no ants will get on the bench or hives. We find a very successful method instead of the tins, is to wind one or two turns of *Manilla lashing* (used for hay bales, &c.) around each leg and

paint it occasionally with a mixture of tar tallow and kerosene. No ants will pass over this unless it is allowed to get quite hard and dry. Some tack a strip of opossum skin, with fur outside, around each leg, the fur in this case keeps back the ants. Simply painting the legs regularly with kerosene or carbolic acid solution is also effective.

There are some ingenious contrivances made for screwing into the bottom boards of hives which form four legs or supports, each of has a little hooded tin vessel for holding kerosene, over which the ants cannot pass.

Hives on the ground, well covered with long grass, will be free of ants until the grass gets dry.

If the beekeeper bears in mind that kerosene, tar—both coal and Stockholm—oil or grease, and carbolic acid, are all substances over which ants will not pass so long as they are not actually dry and hard, it will be no difficult matter to arrange a bench or stand for hives that will be proof against these troublesome marauders. Our own experience has shown us that this method is simpler, cheaper, and more effective for an apiary troubled with ants than any other, although those several capital devices, such as the screw legs with kerosene cups, are neat and effective where one has only a hive or two. We will now give some of the very numerous methods suggested for destroying or driving away ants from the vicinity of an apiary; for it is found that by persistently disturbing and worrying the nests of many of the common varieties of ants they will almost always move off to new nests some distance away from the old ones.

1. Pick or dig up the ground containing the nests so as to break up all the galleries and brood nests, and with a watering pot wet the whole turned up surface with carbolic acid water. One part of Calvert's No. 5 carbolic acid in 100 parts of water, or with a strong brine if no carbolic acid is available. This will destroy a large part of the colonies and weakens them so much that it will be some time before they become troublesome again, and a second treatment will either break them up altogether or drive them away. Carbolic water is much the most effective.

2. After an ant's nest is in full working in summer and the queens are laying eggs, stop up all the entrances to the nest but the principal one with turf or clay, and pour into the open entrance about an ounce of bisulphide of carbon and cover this entrance also. The queens and most of the ants get killed and the nests will be abandoned.

3. In South America corrosive sublimate is used with success—it is generally powdered, finely sprinkled over the entrances, after which the ground is freely watered with a watering-pot. This appears to slowly poison the whole colony.

Feeding with poisoned food kills an immense number of ants, but as breeding goes on so rapidly we notice no diminution of numbers, unless the queens and eggs are destroyed also, which does not appear to be the case where poisoned food only is used.

The fumes of sulphur are very destructive to ants; but the difficulty is to get it to permeate throughout all the passages and galleries of the nest. One effectual method is to mix about an ounce of guapowder with 4 ounces of flour of sulphur, and pack the mixture into a paper case, like a squib. Light this, and thrust the burning end into the largest entrance, and if the smoke is seen coming out at the other entrances to the nest, most, if not all the colony, will be suffocated.

The *American Bee Journal* of 3rd August, gives a number of receipts for destroying or poisoning ants, from which the following are selected.

1. Sprinkling salt on the mounds.
2. Water with hot water and borax.
3. Water with strong brine.
4. Pour kerosene into the nests.

With each of these methods a second, or even third treatment, is generally necessary. Wherever ants have established a regular track from their nest to any place where they obtain food, the stream can be diverted by the use of carbolic acid water, and stopped altogether by repeated waterings.

Proceedings of Beekeepers' Associations.

SOUTH AUSTRALIAN BEEKEEPERS' ASSOCIATION.

THE usual monthly meeting was held at the Chamber of Manufactures on Thursday, October 7; Mr. A. E. Bonney in the chair. There was a good attendance. Eight new members were enrolled.

Mr. C. F. Clough read the following:

FOUL BROOD.

As "foul brood," the most dreaded of all bee diseases, is making such rapid progress in this colony, and now threatens to seriously cripple, if not to extinguish, the industry of beekeeping, I make no apology for again drawing the serious attention of the South Australian Beekeepers' Association to the subject, in the hope that efforts may be made to obtain some legislative assistance in our fight against the scourge. The disease has obtained so firm a foothold in the district of Mount Barker that there is scarcely an apiary that has not suffered, and it is to be feared this is the case throughout the province.

Members will recollect that the statistics gathered by our Hon. Secretary at the end of the season just past showed that more than half of the beekeepers who forwarded answers had "foul brood" in their hives, or had had

it previously. With such a prospect before us, is it likely that capital will be invested in the industry, or that beekeeping as a national pursuit will make any progress? South Australia is admirably adapted to become a honey-producing country; the climate is much superior to that of America, where the largest production occurs. We have no hard winters; the bees work for months instead of weeks. Our glorious *eucalypts* secrete thousands of tons of the finest-flavored honey, and beekeepers only are wanted for this bountiful harvest to be garnered. The crop in the United States is enormous, California alone producing 5,000 tons of honey per annum. Canada has an income of £100,000 from this source. In the Old World the industry has for years past yielded astonishing quantities of honey, but accurate statistics are not available.

Why should not Australia, with such exceptional advantages, take her proper place amongst the great honey-producing countries of the world, and make honey and wax another of her staple industries? If every inhabitant in these colonies consumed only a single pound of honey per annum nearly fourteen hundred tons would be required every year to supply it.

If "foul brood," the most infectious and exterminating of all the diseases the beekeeper has to combat, be not earnestly grappled with and banished from our apiaries, this prospect will be impossible of realisation, and beekeeping will never assume any proportions. To meet this difficulty inspectors should be appointed, and power given them to enter upon any land where bees are kept, and to call for the hives, &c., to be opened in their presence. If "foul brood" be discovered the proprietor of the apiary should be compelled to immediately eradicate the disease, or submit to all infected hives, &c., being destroyed by fire under the inspector's directions and in his presence. Without such assistance on the part of the State all beekeepers are completely at the mercy of any careless or thoughtless individual whose bees are infected. Men who have a few kerosene-box hives are the greatest offenders in this respect. They never examine their hives except when the honey is taken, so that "foul brood" runs its course unchecked; and when all the bees are dead the proprietor generally uses the cases as feed boxes for his horses, after scattering the rotten combs about the ground, where his unfortunate neighbors' bees soon discover them, and so carry the scourge into every hive in the vicinity.

"Foul brood" is by no means a new thing. It is supposed that Aristotle refers to it when he speaks of a bee disease characterised by a disgusting smell in the hive. Coming to modern times, Bonner, in his "Beekeepers' Companion," published in England in 1798, devotes a chapter to what he calls "an uncommon disaster which sometimes, though

rarely, happens to bees;" and he says—"He saw plainly that the young were all going backward in the cells, and that he looked down between the combs, but was unable to proceed for the stench that the rotten maggots produced." In America it was studied by Quinby as far back as 1835, and in Germany by Dzierzon in 1818, whose apiary was ravaged by it. Civilisation has made the spread of the pest much easier than in former times. Queens are now sent by post to all parts of the world, and colonies of bees are constantly changing hands. In South Australia the box-hive men have suffered severe losses; the disease attacks the hives and runs its course unchecked right through the apiary. This is the general complaint throughout the hills districts, and it is to be feared the disease is equally virulent in other parts. My own little apiary of ten hives has recently passed through the ordeal. In July two very warm days occurred together, and during my absence from home robbing was actively carried on in a very weak colony, and the combs completely cleared. On the first opportunity I overhauled the hive, and was disgusted to discover a few cells of "foul brood." The consequences, of course, were easily predicted, and in a few days every hive showed some traces of it. I thereupon set to work and transferred all the bees, according to Muth's directions, which I shall give in detail further on. At the same time everything about the apiary was either burnt, if of no value, or passed through a half per cent. boiling solution of carbolic acid. The result attained has been perfectly successful, and the disease has been stamped out.

"Foul brood" when once seen is afterwards easily detected, and the characteristic smell in bad cases is never forgotten. The first signs of the disease are shown in the uneasy movements of the larvæ in their cells, when instead of lying coiled up, as we see them in a healthy condition, they present their backs to our view. The glistening pearly whiteness gradually disappears, and a yellow tint is seen, gradually becoming darker and developing into a brown, when the grub dies and becomes rotten, and a sticky tenacious mass of a coffee color remains. By and by this dries up, and a dark scale is seen lying at the lower side of the cell. The infected grub is frequently sealed up like the others, but the capping of the cell then shows the condition of the affairs within; the healthy convex appearance has left, and in its place we find the surface either flat or depressed, and many of the coverings are torn or pierced with a small hole. If a twig be inserted and withdrawn the coffee-colored substance will follow it for a considerable distance, and then spring back again into the cell. This is very characteristic of "foul brood," and is caused, as Cheshire shows, by the trachea or breathing tubes of the larvæ resisting decomposition longer than the other portions.

The bees themselves seem to know that their hive is sorely stricken, for in bad cases they appear to lose heart, and move about in a languid manner, though they redouble their efforts to ventilate the hive, and numbers can be seen constantly fanning at the entrance. If the hives be near together it is suggested that the germs may be carried into the neighboring one by the strong currents of air so set up. The unfortunate insects also endeavor to carry out the putrid stuff, and in severe cases this is left smeared about the alighting board, a standing menace to every other hive. When the disease has complete possession of the combs they become rotten, and emit a disgusting smell, which forces the bees to swarm out and seek new quarters. The odor can then be perceived at some distance from the hive. The beekeeper should never wait till this stage is reached, but be always on the alert to detect the earliest indications. The woodcuts of "foul brood," as usually given in bee books, are true enough, but they should be banished from the beginner's mind, for, as a rule, he will not admit to himself that the disease exists in his hives till the appearance resembles the illustrations; it has then taken too firm a grip to be easily dealt with. Generally speaking only one or two hives are contaminated from an outside source, and the unsuspecting beekeeper completes the mischief himself by failing to disinfect his hands, and in this way he carries the germs from hive to hive. A sponge wetted with a one per cent. solution of phenol should always be used to moisten the fingers before opening another hive. If the disease be in the neighborhood, and near enough to be a cause of anxiety, a little medicated feed (salicylic acid) may with advantage be given occasionally to act as a preventive. About ten grains to a quart of syrup would be strong enough.

The origin of the disease is accounted for in many different ways. Some consider it arises from the brood being chilled, which then becomes the dreaded "foul brood;" others again attribute it to honey dew, fermenting honey, and (in a delightfully general way) to "climatic causes." One theory asserts that the queen sometimes deposits her eggs the wrong way up, and these putrefying, contaminate the others. Modern scientific research has, however, demonstrated in the most convincing manner that, like many other diseases of similar characteristics, "foul brood" arises from a specific germ, and that this, and this alone, will produce the disease.

If a perfectly healthy larvæ be crushed, and a little of the liquid placed under a microscope, the field will show numerous fat globules, with large white blood discs scattered here and there, and a large number of tiny globules with lively movements. These appearances are normal. If, on the other hand, the subject be a recently-stricken grub, turning yellow, a large number of rod-like bodies are seen

swimming about, whilst strings of them are frequently met with attached to one another, end on, presenting what is termed the leptothrix form. These rod-like bodies are the bacillus alvei, or specific germ of "foul brood." They are very minute, measuring about 1-7,000th of an inch in length, with a breadth of 1-21,000th. In the course of time the fat globules and the blood discs become used up, and the germ changes in its appearance, becoming shorter and thicker, and of an ovoid shape; the rods all disappear, giving place to these spores. To the naked eye the grub has changed to the dark, sticky, coffee-colored substance known so well, unfortunately, as advanced "foul brood." Messrs. Cheshire and Watson Cheyne cultivated numerous samples of this in gelatine and other media, extending the process in series; after many cultivations some sterilised milk was inoculated from the last test tube, and in a short time developed the smell and other characteristics of "foul brood." Portions of a healthy frame of brood were sprayed with this liquid, whilst other parts were protected; wherever it fell upon the larvæ they became badly diseased, but those not touched by the spray remained quite healthy. The August number of the *Royal Microscopical Society's Journal* for 1886 contains a most interesting and exhaustive paper by Messrs. Cheshire and Cheyne on the life history of this germ, and members will be much interested in following out the numerous experiments.

The methods and remedies for dealing with "foul brood" are very numerous, but they may be divided into three great classes:

1. Disinfection of hive and combs without destruction.
2. Destruction of hive and contents by fire.
3. Removal of combs and providing clean hive.

1. It will be readily understood how reluctant a man is to sacrifice the beautiful combs that he has been at such pains to secure, and burn up an expensive hive. We may, therefore, expect to find most of the remedies in this division. They are plentiful enough, and embrace such items as coffee, camphor, eucalyptus oil, corrosive sublimate, phenol, salicylic acid, and a host of others.

The method so frequently advocated, of spraying combs with phenol, salicylic acid, &c., cannot, in my opinion, be too strongly condemned, for whilst the combs are undergoing the operation robber bees are carrying off the infected honey, and a more certain way of spreading the disease cannot be imagined. Were this process successful in the results attained, something might be said in its favor, but I doubt whether anyone has yet shown a permanent cure in any single instance. Phenol (1 in 200), salicylic acid (1 in 80), and corrosive sublimate (1 in 20,000) have been used in this way. The disease will certainly be checked and may disappear, but it is to be feared only

to break out again and run its course through the apiary, whilst the unfortunate beekeeper is lulled into a false sense of his security. The silk linings in the cells from which young bees have emerged must necessarily be difficult to disinfect, and I think most beekeepers will agree with me that it is quite impossible to effectually, and with any degree of certainty, cleanse such combs of the lurking germs of "foul brood."

Lumps of camphor on the bottom-board have been tried. The disease is said to be checked somewhat, but not cured, and the bees, not liking the strong smell, cover the substance with propolis. Bertrand's fumigator merits passing notice for its ingenuity. In this a gramme of salicylic acid is gently evaporated over a small lamp, and the nozzle of the apparatus inserted in the entrance; the vapour thus reaches all parts of the hive. The process is a failure.

One of the earliest ideas for combating the disease was the removal of the queen.

Dzierzon's method is given in the following extract:—"When the malady makes its appearance in only two or three of the colonies, and is discovered early (which may readily be done in hives having moveable combs), it can be arrested and cured without damage or diminution of profit. To prevent the disease from spreading in a colony there is no more reliable and efficient process than to stop the production of brood, for where no brood exists none can perish or putrefy. The disease is thus deprived both of its ailment and its subjects. The healthy brood will emerge in due time, and the putrid matter remaining in a few cells will dry up, and be removed by the workers. All this will certainly result from a well-timed removal of the queen from such colonies."

In Heddon's book a modified process is given:—"The first step taken was the immediate destruction of the queens of all infected colonies. Nine days afterwards all the queen cells were removed, and this was repeated six days later, shaking the bees from every comb to make sure that none were overlooked. All were now hopelessly queenless. A frame of eggs and just-hatching larvæ was given them, allowing each colony to rear its own queen, the object of this being to give the bees ample time to clean up their combs before the young queen began to lay. If any diseased larvæ remained in the cells 21 days after the destruction of the old queen I carefully removed it with the head of a large pin. By this process there was a period of about 35 to 40 days with no eggs being deposited in the combs, and developing no larvæ to feed the disease. Of the 23 colonies thus treated the disease reappeared in only two, and the queens of these were mated with black drones, and I am confident some germs of the disease remained in these combs. A repetition of the above process eradicated the

last vestige of the disease from the apiary. I have never discovered any symptoms of it since."

Cheshire, already alluded to, one of the most scientific authorities on the subject, whose researches have made his name famous, insists on there being a queen in the hive, and he applies his remedy (phenol) by feeding the bees with medicated syrup.

In his paper on "Foul Brood," read 25th July, 1884, Mr. Cheshire argues that the remedy should be given in the food, but he found that to place the bottle with added phenol on the hive would, however, do nothing in the great number of cases. If honey were coming in the bees would not touch the mixture, but open the stocks, remove the brood comb, and pour from a bottle having a dropping tube loosely placed in its neck the medicated syrup into those cells immediately around and over the brood, and the bees would and did use a curative quantity of phenol.

Further on he says:—"Last autumn I inoculated a stock and allowed it to get into a bad condition. I then inserted a comb of store in the centre of the brood nest, and treated one side. The disease disappeared, but raged, although with abated fury, in the other half. . . ."

Having found that 1 in 200 was refused by the bees altogether; that 1 in 400 might be given constantly to a sound stock without appearing to limit the queen in breeding, or touch her health; that 1 in 500 dispatched foul brood quickly, even while honey was coming in, and that 1 in 750 appeared enough when it was not, I have established these quantities as the correct ones. I then, in the interests of apiculture, requested the British Beekeepers' Association to provide me with a bad case so that the attention of beekeepers' might be arrested. The colony has been supplied me by the kindness of Mr. Mills, and has been open to visitors, marked by Mr. Hooker, and officially attested. When it arrived on the night of 21st June it contained seven frames, only bees enough to cover two of them, and queen cell afterwards found to contain foul broody matter only, scarcely any living brood, and a good deal of dead. A casual counting of one of the best frames gave 371 dead larvæ on one side. The odor was pronounced. A case such as this would have been utterly hopeless on any plan but the one I am now advocating. . . . I had stipulated that the hive should have a queen, so my difficulty was greater than I had anticipated, and yet the hive is here to-day, strong, vigorous, and healthy, and has been so for a week passed. No cell has been uncapped, no diseased grub removed by me. My treatment has been giving food, and getting that food converted into bees as rapidly as possible. . . ."

Mr. Cheshire then describes how a queen was given to the colony, and proceeds:—"I waited three days till she was regularly laying, giving them syrup phenolated by 1 in 500. . . . The bees were now shut up to four frames, and those behind the division board, waiting introduction as the bees multiplied, smelt so badly—the weather being hot—that for comfort of self and bees I was forced to spray with water 200, phenol 1. Every evening the medicated syrup was given. The smell vanished, the bees became active and earnest. The comb, with 371 dead larvæ on one side, was last added, and in six days I could find only five sunken cups in the whole of it. Now and again a grub did take the disease, but quickly perfect immunity was the issue. The brood is now as bright, pearly, and healthy as any I have seen. . . ."

Professor McLain's method is given in the *American Bee Journal* of 15th September, 1886, as follows:—"Take of soft water three pints; of dairy salt 1 pint. Use an earthen vessel. Raise the temperature to 80 degs. Fah.; do not exceed 90 degs. Stir till the salt is thoroughly dissolved; now add one part of soft warm water in which has been thoroughly dissolved four table-spoonsful of bicarbonate of soda (use the crystals); stir thoroughly; add to this mixture sufficient sugar or honey to sweeten it, but not enough to perceptibly thicken it. Now add one-quarter ounce of pure salicylic acid. Mix thoroughly. Let this mixture stand two hours, when it becomes settled and clear.

Treatment.—Shake the bees from the combs, and extract as clean as possible. Now thoroughly atomise the combs, using the mixture and a large atomiser. Return the frames to the colony. If there is no honey to be obtained from the fields, feed honey or syrup to which has been added three table-spoonsful of the mixture to each quart of honey or syrup; stir well. The honey just extracted may be used without injury to the bees if the mixture is added, but no more should be furnished than is consumed. Atomise the colony two or three times more, simply setting the frames apart so as to direct the spray well over the combs and bees—not brushing off the bees. Three or four days should intervene between the times of treatment. The last may be given on top without removing a frame. As a preventative apply on top of frames, or in any way by which the bees may get it. . . . I would recommend that you give the entire apiary one application of the mixture prescribed for cure, as this treatment frequently prevents the presence of the disease where it was not before possible to detect it. The quantity prescribed for use by means of a large atomiser is sufficient to treat 150 colonies. Not reckoning the sugar or honey used, the cost will not be more than 15 cents. I have prescribed this treatment with entire satisfaction and

uniform success for the past two years. I will mention the facts in two or three of the apiaries for which I have prescribed this treatment:—1. Number of colonies in the apiary, 46; number apparently diseased, 13; number actually diseased, 28. Disease so far progressed that the stench was very offensive in the yard; bees crawling out of the hives to die by tens of thousands. Effect of treatment apparent in one day—a permanent cure in each case. 2. Number of colonies, 60; serious cases, 38; combs black and putrid; a few had already been burned; effect of treatment apparent at once; a permanent cure in each case. 3. Number of colonies, over 150; number of colonies, over 150; number of colonies diseased, 60; bees swarming out; stench from hives nauseating; combs black and rotten; brood putrid; whole apiary treated; disease immediately arrested; effect of treatment on affected colonies instantaneous, even on apparently hopeless cases; every colony cured; disease eradicated, leaving no trace behind. Colonies all soon became strong, healthy, and prosperous.”

2. The next division, that of the complete destruction of hive and contents by fire, is a most effectual method of dealing with the disease, and is akin to the plan advocated by one of our members, who cures a hen of eating her eggs by cutting her head off! Alley expresses his opinion with no uncertain sound:—“If my apiary were infected with this disease, I should remove the queen from every infected colony, and at once utterly and totally burn and destroy every trace and vestige of hive, frame, and comb, even going so far as to burn up the stand upon which the hive containing the infected colony was placed.”

The beekeeper may require much moral courage to bring himself to utterly destroy a beautiful colony of valuable bees in, perhaps, an expensive hive, but if he possesses an apiary of any size it may after all prove by far the most economical course in the end. A. I. Root's case affords an “awful example.” His apiary of about 500 hives was attacked in July, 1886, and he is still “experimenting.” Had he immediately burned the one or two colonies—bees, hives, and all—on the very first appearance of the disease, he would long since probably have stamped it out.

3. My last division contains the methods of Quinby and Woodbury, with the modified systems of D. A. Jones and Muth, offshoots from the first two.

Quinby's treatment is given as follows:—“The first thing to be done is to confine the bees in an empty hive or box, set them in a dark cool place, and let them remain there at least 24 hours that all the honey they carry with them may be consumed. There is no doubt but the honey from an infected hive will carry the contagion to a new stock of brood. After a sufficient time has elapsed

to prevent this danger the bees may be put into a hive filled with healthy combs or foundation. The portions of comb containing the diseased brood should be carefully cut out and buried, and the remainder converted into wax. If honey remains it can be utilised for feeding by thoroughly boiling and skimming it. . . . The condemned hive may be cleansed completely by scalding it with boiling water and scraping thoroughly. Exposure to the weather will usually complete the disinfection.”

Woodbury, the English apiarist, extirpated the disease in 1863. His method was to cage the queen in an empty hive or box, into which all the bees were quickly brushed to prevent them from taking much of the infected honey with them. In this hive they remained three or four days, and were then put into a clean one and supplied with a few pure combs. As soon as they appeared to have settled down and become contented their queen was released. In this manner he treated the whole apiary, which was very badly diseased, and a permanent cure was the result.

D. A. Jones, the Canadian authority, proceeds thus:—“Remove all the combs not containing brood, extract the honey, and boil it, then it is ready to feed back. Render the combs into wax and make it into foundation; boil the frames fifteen minutes, and fill in the foundation again, placing them in clean hives. Drum and smoke the bees until they all fill themselves with honey—(this is very important, for if some are not filled they will die when others have plenty); shake off the bees, leaving enough to nurse the brood; place them in a box covered with wire cloth, carry it to a cool dark cellar or beehouse, lay it on its side, and allow the bees to remain there from sixty to eighty hours, until they drop and show signs of starvation; then shake them into the clean hives with foundation, feed them, and put them into a new location, at least one or two miles away from the diseased yard. As soon as the queen and bees are removed for starving, the hatching brood and bees should be doubled up, so as to have all colonies full of combs of hatching brood. The empty hives thus secured should be scalded for future use. As soon as all the brood hatches the bees may be brushed off the combs after being made to fill themselves with honey, like the first lot, placed in boxes, and treated in the same way. Now bring the first lot purified back to the yard again, and you have all your bees and hives purified and free from disease, if you have done it as it should be done, without any loss except your time.”

The next process is that of Muth, who feeds medicated syrup after the transfer. This is the method I have lately carried out with success, and I therefore give it in detail:—

Examine very critically all hives in the apiary, marking off those that show the

disease or are suspected. After dark close the entrance of each clean hive with perforated zinc or wire cloth, to prevent bees from the infected hives from gaining access, and so spreading the disease. Next morning, having already prepared perfectly clean hives, and provided them with three or four frames each, according to the strength of the colony, and with starters (not whole sheets) in the frames, transfer the bees into their new quarters, taking out the frames one by one and shaking off the bees upon a sheet of paper in front of the hive. Take care to secure the queen and place her in a queen cage suspended between the frames. She should be kept there till the evening of the succeeding one, when she may be released if the bees have settled down. Finish off each colony by feeding with a quart of medicated syrup, described below. This should be given warm, as it is then more readily accepted, and should also be placed inside the hive to prevent robbing. No honey or syrup should be left about for the same reason. Collect with the greatest care all the infected frames, combs, &c., from the diseased hives and bury or burn them; also burn the hives if they are of no value. If, however, they are good ones, let them be thoroughly well boiled, using about four ounces of the better class of carbolic acid in the copper as a precaution. Let all adhering wax, propolis, &c., be scraped off, and the hives scrubbed clean with soap and hot water. Calvert's 20 per cent. carbolic soap is excellent for this purpose. These hives can then be used again with perfect safety. It is very important during the cleansing process that the cleaned hives be not handled with dirty fingers. Let each be put aside before another is commenced. To save purchasing new hives during the transferring, clean kerosene boxes may be used temporarily, adapting them to the Langstroth frame. It would be better to burn all such boxes afterwards, including the quilts. After dark release the bees from the hives that were closed up whilst the infected colonies were being dealt with. Examine the transferred colonies in three or four days' time, and give each one another good feed of warm medicated syrup. They can afterwards be fed with plain syrup if no honey be coming in, but care must be exercised that each has sufficient stores to keep the bees alive and enable them to build down new combs. The operation of transferring the bees from their infected hives should be completed in one day, and no diseased hive should be left for another occasion. The act of stamping out should be completed in one effort, and the apiary is then clear. It is possible, however, that the signs may have been overlooked in the colonies supposed to have been clean, and a vigilant eye should therefore be kept on these to detect the first stages of the disease. If it should appear, the colony showing it should be dealt with in a similar way, but the work should

not be commenced till evening, when the bees have all returned home. The operator must take care that no honey, bits of wax, &c., are dropped about, or the disease will spread, and he ought therefore to lay down newspapers over which to lift the combs. The papers can then be burned. It is also as well to burn or thoroughly disinfect all alighting boards, covers, &c., used in connection with the "foul brood" hives, and to skim the surface of the ground where those hives stood.

When "foul brood" is suspected in the apiary—and what beekeeper is not always in dread of its appearing?—the fingers should be washed with phenol solution before opening each hive. I use a quarter of an ounce of absolute phenol to a wine bottle of water, which gives about 1 in 100, and keep a piece of sponge moistened with it. The new hives or boxes, frames, feeders, &c., before being occupied by the transferred colonies should also be washed over with a phenol solution and allowed to dry. A strength of 1 in 200 is sufficient for this purpose.

For feeding the infected colonies after transfer make the following syrup:—White sugar, 10 lbs.; water, seven pints. Add the sugar gradually to the boiling water, and allow the whole to simmer for a few minutes. Give one quart of this to each colony in any kind of inside feeder after adding one ounce of the following mixture:—Salicylic acid, 16 grains; soda borax, 16 grains; water, one ounce. To prepare this, grind up the borax and mix it with the salicylic acid; add a little water and work the mixture into a dough, then add it to the balance of the measured water and shake till it is dissolved. One ounce of this solution should be stirred into each quart of syrup. It is better to mix a bottleful of the salicylic solution and keep it on hand. A trifle less than one ounce av. each of the acid and borax is the right quantity for an ordinary wine-bottle.

There are instances of the disease dying out of itself, and L. C. Root ("New Beekeeping") states that in 1870 some stocks were infected when the winter commenced. These were marked and put into the cellar, and when opened up in the spring it was seen that the bees were perfectly healthy, and no trace of "foul brood" was discoverable.

There are many interesting points which I have been obliged to leave unnoticed, such as the debated question of how the disease is conveyed, whether in the honey or by spores on the bee; whether old bees are affected by it, or the brood alone suffers.

I would say in conclusion that there is much that is obscure in "foul brood," and that further research is urgently needed to throw light upon the subject.

Mr. A. E. BONNEY had never been able to cure the disease of foul brood, except when all the old combs had been removed. All the cures he had heard of had been effected by

Muth's method. Alcohol was the best solvent for salicylic acid, for if borax were used for the purpose, there was some danger of killing a few of the bees.

Mr. F. A. JOYNER had cured his bees by Muth's method. He had failed with phenol in all its forms.

Mr. S. RANDELL had tried McLain's method, and found that the bees took the sweetened food, but there was no provision made for removing the foul brood in McLain's system.

Mr. H. JAMES had not been successful in curing his bees by McLain's method, but by Muth's method he had been successful. Two hives that he had put aside, taking out the combs and giving them fresh ones, shows a curious case. One was apparently cured, but the other was as bad as ever.

Mr. S. DICKINS had tried Cheshire's plan in England with success, but here the disease appeared to be more virulent. He had also tried Bertrand's fumigator in England with success.

Mr. C. N. COLLINSON had experienced foul brood, but had burned all the combs and frames, given them fresh frames with foundation, besides cleaning the hives, but from "an ancient and fishlike smell" in the locality he feared that he had not been successful.

Mr. F. A. JOYNER offered comfort to Mr. Collison, as he had noticed a similar odor, which he discovered to be due to the presence of "Dandelion" or Cape Marigold.

Mr. A. E. BONNEY said the difficulty of cleaning hives and frames by boiling was aggravated by the small size of the boilers in domestic use. To get over this he had narrowed his hives to one foot. [A member suggested that it would have been better to have widened the boiler.]

In answer to a question, Mr. CLOUGH read a paragraph from Mr. Cheshire's work, in which he declared expressly that the bacillus of foul brood was discovered by him both within the body of the queen and within the eggs—these eggs are very carefully guarded against outside contamination.

Mr. CLOUGH, in answer to various questions, said that the boiling of the frames for fifteen minutes would kill all germs of foul brood. As to how germs are carried from hive to hive he was dubious. He could not understand why a person handling a foul frame and going to a clean hive should carry it, when by emptying a whole colony of infected bees before a clean hive with clean frames, &c., the new hive would not be infected.

A Sub-committee was appointed to draft a method of cure of foul brood for publication.

Mr. C. F. Clough exhibited a single-cell battery used for heating the wire in wiring comb foundation. The idea of fixing foundation to a wired frame by aid of the galvanic current had occurred to him more than a year ago, when he spoke of it to Mr. Ellery, who, he found had already been using the method and has since

published it in American and other beekeepers' papers. The advantage in this process was that the wire being hot and the wax cold, it adhered firmly. He showed practically how it worked.

Extracts from Foreign Journals.

INTRODUCING QUEENS.

SOMETHING NEW ABOUT THE BUSINESS.

From the Canadian Bee Journal.

By JOSHUA BULL.

It is perhaps out of season to speak of introducing queens in winter, but as I have something that I wish to say upon this subject a little different from anything which I have ever read or heard of so far as I can remember, in fact, I believe I have made a new discovery in this business, and as I could not find any time to write about it during the more busy summer months, I venture to do so now, and perhaps the best way to convey a clear understanding of the matter will be to give a brief account of the circumstances which led to the discovery of the principles involved in the facts of the case.

In the summer of 1885 I removed a couple of brown queens from their respective colonies, in order to introduce Italian queens in their places. Having no further use for those old queens I determined to experiment with them a little, and see if I could not increase my stock of knowledge somewhat, at their expense. Accordingly I went to a hive containing a strong colony of bees, with a vigorous, healthy-looking young hybrid queen inside; and placing one of those old queens upon the alighting board of this hive she walked right up to the entrance, the guards smelled at her and gave a sort of royal salute, and she went in without halting at all. I waited awhile to see if any disturbance would follow but all continued quiet, not the least sign that anything unusual or unexpected had happened. I then passed on to another colony in similar condition, so far as I knew at the time, and placed the other queen on the alighting board as before. The guards rushed at her in an instant, and in an agitated manner warned her off; she walked around awhile as though pondering in her mind what was the best thing to do next, and then marched up to the entrance with an air of determination to go in regardless of consequences; but the moment she entered the passageway she was seized by a number of the guards and dragged to the outer edge of the alighting board (which was about 12 in. wide) and very significantly given to understand she must leave the premises, but she had one wing clipped and could not fly and therefore could not leave. It was really amusing to see the manoeuvring of those guards as they marched to and fro about the entrance to keep her from going into the

live. At length when I got tired of watching I took up the queen again and went back to the colony which received the other one and put her down at the entrance, and she also was allowed to go in unmolested; this colony then had three queens in its midst. I left them until next day when I opened the hive and the three queens all alive and well; everything quiet as a summer eve; each queen in a comb by herself; thus occupying the three central combs in the hive. The two old queens had each of them laid, during the time, a quantity of eggs, but contrary to my expectations, the young queen had not yet become fertilised, and in this fact lay the whole secret of the mystery. Until I discovered this I could not understand why one should accept a strange queen, so willing, while another would indignantly refuse to receive one. I believe it is generally concluded that a queenless colony having capped cells in the hives will quietly accept a virgin queen if introduced soon after hatching. From the foregoing premises I have drawn the following conclusions:

1st. When a queenless colony of bees have a queen cell all capped and finished they instinctively expect that according to the natural order of things, a virgin queen will appear in their midst; therefore, if one is introduced at such a time she will be kindly received, while at the same time if a laying queen should make her appearance among them, she would be looked upon as an intruder and treated accordingly.

2d. When a colony has already got a virgin queen which is old enough to fly and she is expected to become fertilised at any time, then their instinct teaches them that the next thing in the natural order of events will be a laying queen and if at this juncture, the virgin queen be removed, and a laying queen be put in among them, they will, of course, invariably accept her as a matter of course, and greet her with demonstrations of affection. It will be seen that when introducing new queens to a colony of bees conditioned as above, that everything works in harmony with the natural laws of their instinct, whilst the operator accomplishes his purpose by adroitly following their designs, and gives them a queen of his own selection in place of the one which he removed without shocking their sensibilities or arousing any suspicion that their work has been interfered with. Although the odor of a virgin queen may be a little different from that of a fertilised one, yet that change of odor is what they are looking for and therefore nothing develops just according to their expectations; no disappointment and no cause for dissatisfaction; they do not recognise her as a stranger but as their own in a new stage of development.

Since I discovered this way of immediate introduction of fertile queens, I have practised and experimented with it repeatedly

and with complete success every time, until I am inclined to believe that it will prove as near infallible, when all the conditions are right, as any method yet known.

Now, friendly editor, will you please tell us whether there is, or is not, anything really new contained in this method of introducing fertile queens. Has any one else ever tried it, if so, with what result?

Seymour, Wis.

FOUL BROOD AND DEAD BROOD.

Letter by Mr. S. Simmins to the British Bee Journal.

AGAIN and again this subject crops up, and one hears of whole districts plagued with the dreaded malady. Dreaded, I say, because it is now and ever will be a dark cloud hanging over our industry, when we consider what a number of beekeepers there are who cannot, or do not care to take the trouble to put a stop to it.

Was not Mr. Cheshire's remedy to drive the scourge from all apiaries? and did we not hail his discoveries with rejoicing? Yet why is it so few have been able to cure by the phenol treatment, and others report that it is of no use? The present state of things shows that either the treatment is not carried out as Mr. Cheshire has advised, or else that he himself overlooked some factor which gave him an advantage; while his followers have been unable to grasp the entire subject in consequence of this one point not being brought before their notice. The fact is, my esteemed friend does appear to have overlooked a matter of the greatest importance which gave him a decided advantage over those who attempt to follow him.

It will be remembered that Mr. Cheshire had a very badly diseased hive provided for experiment, and it is in just such a state that many allow their hives to get before they become aware of the trouble. But note this: there were *very few bees and no queen*. And what did Mr. Cheshire do? *He gave them a young healthy queen and two frames of clean brood*. Why, reader, here was health to start with, and then by feeding constantly with medicated syrup, the operator would have it all his own way.

The healthy bees would have little trouble in removing the disinfected foul brood, as I am aware from the fact that under certain conditions the original inhabitants will clear out the filth without it being disinfected. During my own experience some ten or twelve years since, I found that a populous colony would throw out every vestige of diseased brood if the queen were removed. I have also found since, where any bees happened to be bought having the disease, that by removing the queen and inserting a cell from clean stock, on the point of hatching, every particle of the putrid matter has been removed by the

time the young queen was ready to breed; the disease again appearing, but with less virulence, until medicine was given.

It will be readily seen, therefore, that where a bad case will not give way all the time the original queen is allowed to continue, a change to a young and vigorous mother will impart energy and determination to the workers, and then Cheshire's remedy will *never* fail.

Where the bees are so reduced as to be unfit for brood-rearing, of course they are not worth the addition of a new queen and more bees or brood, but should be immediately smothered, and the combs burned or reduced to wax. On the other hand, it will probably be found that when a stock is not very badly infected, the feeding of phenolated syrup, or its injection into the cells when the bees will not take it, will be found effectual without removing the queen. Another point which appears to have escaped notice is that all sealed honey must be uncapped and likewise disinfected, or the disease is likely to reappear from time to time. Where there is much sealed honey, uncup a portion only at a time, and if possible do not contaminate the extractor.

What is done should be done thoroughly, and experiments left to be carried out by those who can afford the time, and have nothing to fear from risk of infection.

Mr. Ward of Highgate, when visiting my apiary, stated that he failed to cure with phenol until the original queens were removed from his infected hives, and others from clean stock inserted. Notwithstanding, therefore, that Mr. Cheshire considered it a great disadvantage to have received his diseased hive without a queen, it was the one thing that ensured success, in that he gave a healthy queen as well as clean brood.

It would appear, therefore, that when a queen is badly diseased, the phenol treatment does not renovate her impaired constitution. The workers probably are cured by taking the medicated food; but just here is the point: Does the queen, or does she not, receive the phenol in the food prepared for her by the workers? Perhaps Mr. Cheshire will pursue his investigations farther, and benefit us all by giving some definite information upon this point.

That phenol is a cure for foul brood is certain, that it gives health to the workers appears equally true, and that in future it will prove effectual in *every* case, I feel convinced, if the queen is superseded when the disease does not at first give way.

DEAD BROOD.

That foul brood is often confused with simple dead brood I am well aware. The latter I have observed occasionally, and have never allowed it in any way to interfere with necessary manipulations, such as uniting, queen-raising, &c., as I have no fear of communicating disease. At present I am unaware of any cause for this, unless it be weak-

ness of the queen, as by inserting a fresh one, all is cleared out while no more is found, and no medicine is necessary.

HOW TO DISTINGUISH BETWEEN THE TWO.

In some respects the two are similar, much of the larvæ turning rotten, and of a dark color, while the bees seem unable to remove such as is in that state until the weak queen is taken away. Nevertheless, some of the matter being placed under the microscope, Mr. Cheshire was unable to find the slightest trace of disease.

But that every beekeeper may decide for himself without the aid of a microscope which is the genuine foul brood and which not, I will show how I have always been able to detect the difference. With simple dead brood, while some may appear like the foul disease, much of the older brood *dries up to a white cinder*, in many cases retaining its original form, which I have never found to occur when genuine foul brood is present. Chilled brood can be distinguished from the more serious malady in like manner.

S. SIMMINS.

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Editorial.

HINTS FOR JANUARY.

THE summer being now fairly established, and the first honey flow over for all except mountain localities, the beekeepers generally have somewhat less busy times. In mountainous localities lying over fifteen hundred feet above the sea level the chief honey flow does not come on till near Christmas, and is at its height in January. For such localities our hints for November and December will apply. In lower lands very much will depend on the season that has past whether bees can still gather honey from clover and late flowering shrubs. In many places the eucalyptus will afford a generous supply throughout the summer and autumn months, and constitute the chief source of autumn-gathered honey in these latitudes.

Increase by swarming has been unusually great this season in many places, and our late rains will lengthen the first honey harvest, so that swarms from this year's prime swarms may be expected well into January, and later in higher grounds, therefore beekeepers will still be kept on the watch.

It is well to strengthen up all weak stocks or late swarms by uniting, for it is bad policy to have a lot of small colonies struggling for existence, exposed to robbing whenever honey gets scarce, and requiring great care and feeding to bring them up to a state for going through the winter. Some information about uniting is given in another part of this number.

Foul brood is destroying numerous stocks, and whole apiaries, where it is not battled with, and in places where its very existence is denied, and it is just when the first rush of the honey season is over that bees are most liable to contract this pestilence, therefore every careful beekeeper will examine his

stocks, and take action whenever he sees any signs of it. See that every stock possesses a queen, for queens often get lost from old age or otherwise, without leaving behind them eggs from which the colony can raise others.

Unless extracting has been carried on regularly it will be well to extract from outside or surplus combs at once, as later the honey gets so thick that it is difficult to throw out. All section boxes in the supers that are sealed or filled should be also removed, as they get discolored if left in the hive during the bees' idle season. Those partially filled can be put back as soon as honey is found to be again coming in, or they can be extracted and the combs carefully preserved for use when required. Beekeepers with boxhives, who take their honey by the "robbing" process, had better do it now than later; the honey will be better, and the bees have more time to gather winter stores. If feeding is found to be necessary feed regularly, but not too freely, with syrup rather than, say 1½lb. sugar to the pint with a good teaspoonful of salt. If honey can be got from a source certainly free from disease, it should be made a little fluid with water. Some apiculturists who use honey for feeding boil it to be safe from contagion, it then becomes about equal to syrup, and no better, for all essential oils are evaporated and flavor gone; others add a little salicylic acid to it in order to destroy any possible germs of foul brood. Honey for bee food is undoubtedly best, but the objection is that if it has come from a diseased hive it is almost sure to infect the stock with it, unless it has been boiled or mixed with some germicidal substance like phenol or salicylic acid.

UNITING BEES.

NUMEROUS occasions arise in beekeeping where uniting one or more stocks with another is necessary or desirable, and more

especially where the beekeeper through want of time, or knowledge, or perhaps carelessness, permits second and third swarms to come off his colonies. It is a well-known maxim among apiculturists that *all colonies should be kept strong*; they will be healthier, more profitable, and less trouble than weak ones. The beekeepers' aim, therefore, should always be to avoid weak, dwindling stocks that require constant feeding, nursing and protecting from robbing.

First let us enumerate the circumstances under which it becomes necessary or desirable to unite two or more stocks of bees.

1. In early spring, when some colonies are found to be weak in bees or perhaps queenless—for a weak colony can seldom build itself up in time to take full advantage of the spring honey flow, and a queenless colony will perish unless given a queen or united with a stock possessing one.

2. In swarming time, when small swarms issue from hives, which is nearly always the case where second and third swarms are permitted, such small swarms should always be joined to others as soon after they issue as possible, and if on the same day it is preferable and the process very simple and safe.

3. After the first honey flow it is often found that some colonies have got below the standard from some reason or another, loss or lack of prolificness of the queen, or perhaps robbing or disease, when uniting is the proper course to pursue.

Of course it is bad management to unite a stock however small to one already strong, so long as less strong stocks are in the apiary, still it may sometimes happen that such a course is necessary. A colony that will fully cover five Langstroth frames with bees may be regarded as of medium strength, but not a weak colony. We regard a hive having less than five combs well covered with bees as a *weak one*. Nevertheless, it is often found that a swarm which will cover only three or four combs at first, will increase rapidly, and in a good season fill eight or ten frames and even send off a swarm within a month. As a general rule it pays best to unite weak stocks during a honey flow at the earliest opportunity.

We now come to the various methods advised for uniting stocks or swarms one with another.

1. In the case of small swarms coming off about the same time it frequently happens they unite in one swarm, in which case they can be hived together leaving the two queens to settle the question of supremacy—or the double swarm shaken out on a white sheet on which the hive, which they are to occupy, is propped up an inch or so, to give them free entrance. As soon as they commence to run in keep a sharp look out for one of the queens and catch her and cage her in case she may be required at any time. When swarms form a nice symmetrical cluster the queen is generally

seen near the bottom or apex, and where two swarms cluster together, one or both queens are often seen running in and out among the bees. When it is generally an easy matter to secure one of them.

If a small swarm is hived and another small one issues on the same day, they can be united by shaking the second into the hive in which the first was placed, without incurring any risk of fighting. As regards the queens, one may be caught or they may be left to arrange matters themselves.

2. To unite two stocks not being swarms issuing the same day, other precautions are required. It is generally considered necessary the two hives shall be close to one another, if they are not, approach them little by little by moving either or both hives a few feet (not more than four or five) every evening until they are alongside of one another. Remove the least desirable queen the day before uniting, then, in the evening, open up the hives, spread out the frames in the hives possessing the queen and between each place a frame with bees from the queenless hive. Smoke them well and cover them up. They will be generally found to have peaceably united by next day.

It is thought by many apiculturists desirable to scent the two stocks alike with some strong odor, and it is recommended to spray each stock freely with syrup and water scented with essence of peppermint, essence of lavender, or as is preferred by many German beekeepers, essence of nutmeg. Smoke from mild tobacco is often used for the same purpose. If the combs and bees are scented in this way it is not necessary to alternate the combs, but for our part we have found the alternating combs without "scenting" to be the most certain way.

Many beekeepers advise putting the frames of one colony on one side of the hive and the others on the opposite one and placing one or two empty combs or a wire net divided between them for a day or two. The latter we have found very successful.

Success in uniting depends in some degree on the season. It is much more certain in swarming time and when bee-food is plentiful. It is difficult when honey is scarce and robbers about; it is undesirable therefore, if possible, to do uniting in such times. If, however, it has to be done out of season it will be well to adopt *all the precautions* enumerated.

A queenless colony will generally readily unite with one having a queen, and it then remains to arrange that they be accepted. To secure this the bees of both should be full of honey, scented or alternated. The alternation of frames appears to so demoralise both colonies that neither attempt aggression. As the process of bringing together two stocks which are located some distance from one another is tedious and troublesome, we last season adopted a plan which has answered very well,

and obviated the tedious process of approximation. This is the method: Two stocks are to be united, say A and B; B is to remain in its old position. In the evening, a little before dark, when most of the bees are at home, smoke both stocks well, and after a few minutes move all the frames but one, with no brood in it, from A, and place them in B, alternating them with the frames of B, and smoke the united stock freely. Close them up, but before leaving them put a piece of board in front of the entrance, slanting it, so that it rests on the alighting board and against the front of the hive. This compels all the bees going out to go around the slanting board and induces them to mark the locality, and prevents many from returning to their old hive. The few bees remaining in the old hive, with those returning late in the evening, as well as any old bees going back to their old hive next day, will cluster on the comb left behind, and next evening can be shaken into the united stock, and the frame put back again for any returning bees, and so on. We have found that very few return after the second day. This is far less troublesome than moving a hive three or four feet a day, especially when they are a considerable distance apart.

FOUL BROOD.

(CONTINUED FROM PAGE 84.)

We see that legislation has taken place in some of the Australian Colonies with regard to this bee pestilence, and, as in the case of contagious and infectious diseases among animals, it is intended to provide against spreading *foul brood* through ignorance, carelessness, or indifference of owners, by making it punishable to have hives affected with this disease after due notice of its existence has been given.

In Queensland, we are informed, an Act has been passed for this purpose, and a week or two since a similar enactment was carried in the Legislative Assembly of South Australia. While under consideration in the latter Colony it met with some opposition. The following letters, extracted from the Adelaide papers, show that there are opponents to any legal enactment in this direction, as there always must be where individuals are likely to suffer for the welfare of the many.

A letter, signed Lavington Y. Tite, is as follows:—"Dr. Cockburn, in moving the second reading of this absurd Bill, which is now being rushed through the House of Assembly, made the assertion that all the beekeepers of the Colony had asked for it, and that it would affect no other class. I venture to assert that nine-tenths of the beekeeping community never even heard of such a proposition, and that the effect of its passing will be to stamp out the industry. *Foul brood*, forsooth! The only brood of that description

I know of is the miserable brood of legislators who, with their meddling, paltry, pitiful laws are surely crushing the vitality of the community. It is this class that first legislated to protect the rabbit and the sparrow, and are now worrying and threatening the farmers to compel their destruction; who legislated to penalise the keeping of dogs that killed the rabbits, and now threaten to let loose on the Colony a cruel and malignant disease, the results of which it is impossible to foresee. This is the class that crushed out the flax-growing industry at Willunga, Port Victor, and Gawler, and which, by wicked tariffs and senseless restrictions on trade, load men with heavy burdens grievous to be borne; which has just successfully ruined the Silverton and Western Australian trade, on which so many bright hopes had been built, and discounted the fair chances of returning prosperity. But this *Foul Brood Bill* is the highest height of drivelling inanity, the very topmost limit of even legislative imbecility. If it be suggested to endow the inventor thereof with a fool's cap and silver bells I will promise a handsome subscription thereto. *Foul brood*, indeed! Why, the disease so called is only another name for starvation. The amateurs in beekeeping have filled the Adelaide Plains with swarms of bees out of all proportion to the food supply by the eucalyptus and other honey-bearing trees and plants to be found there, and, as a natural consequence, the young bees are the first to feel the want of proper food, and dying in the comb become putrid. I will guarantee to produce *foul brood* in any locality in three years by simply overstocking. The only remedy is the simple one of greatly reducing the numbers of hives, and so increasing the food supply for the remnant. I suppose it will be asked—What does this man know about it? My reply is, I have been beekeeping for nearly thirty years before most of these dilettante Bill inventors knew the difference between a bee and a blowfly, and that in the season 1881-5 I sold nearly two tons of honey, the produce of my own hives."

Dr. Cockburn is the member who introduced the *Foul Brood Bill* into the South Australian Parliament. The writer of the above letter has evidently no mean opinion of his knowledge of the subject, an opinion I am afraid that will not be shared by beekeepers generally. He speaks with the dogmatism of ignorance. *Foul brood* is starvation, and starvation is *foul brood*, so says Mr. L. Y. Tite. So then must scab in sheep, small-pox in the genus *homo*, and pneumonia, and anthrax in cattle be starvation.

Another writer, signing "Apis," writes, but less dogmatically, yet still ignorantly, as follows:—"As there is a good deal of discussion just now on this subject, I wish to offer a few remarks on it. I do not insist that I am right; I leave your readers to judge for themselves. In the locality where I reside, in and near

the old Barossa diggings, there are several persons who have large stocks of bees. Most of the hives used are the old box hives. I believe they yield well, and all are healthy. There are other parties, however, who think that the new system of bar-framed hives is best, and are going in largely for the improved (?) article, but, unfortunately, *foul brood* has got into these new apiaries to such an extent that it has nearly destroyed several establishments. I have only about 20 hives, but these are fine strong swarms, with not a particle of *foul brood*. All mine are of the old style box hives, and I believe that the bar frames are a great mistake. True, in a good gum-tree flower season, a very large quantity of honey is obtained, but, I fancy, at the expense of the stocks, and the reason I submit is this:—It is not natural; the bees are allowed no rest. In a state of nature the working bees have a spell when the hive is full and live longer, but if forced to work constantly (and they will work so long as their is a comb empty) they are very short-lived. An unnatural strain then falls upon the queen to keep up the population of the hive, and the consequence is that the eggs have not the full healthy vitality that the usual supply would have. A large proportion of the grubs have not strength to develop, and so die. *Foul brood*, or the weakly egg and sickly grub, are unable to throw off the necessary moist exudation as they grow, this accumulates, ferments, and rots, and thus perish the young bees. Too much haste to be rich against nature generally results in disaster. I have examined into the matter pretty closely, and speak from personal experience. By the way, I observe in a recent issue of the *Chronicle*, a statement made that a party found *foul brood* in a swarm that had settled in the hollow branch of a tree. I would like to know how this was ascertained, and how they made the necessary manipulations in such a situation. Whilst on this subject, I may mention that there seems to be a diversity of opinion as to the quality of the bar-frame honey. Some say it is very fine, but others say that it is much inferior to the older honey, that is ripened in the comb in a natural way, and that cannot be acquired in any other manner. Then, again, as to the keeping properties of bar-frame honey. I saw some hives opened a few days since, and the contents appeared like a very thin syrup, and the honey in some other tins opened in a different locality had all become a thick candy."

The fact is, the writers in common, we are afraid, with a majority of beekeepers in Australia, know very little or next to nothing of the disease, and probably have never seen it; hence the authoritative and dogmatic tone of their letters. It is beekeepers of this class who make advance in Apiculture so slow, and who, if they were listened to, would soon make it an industry of the past by encouraging pestilence and bad management. In the

South Australian Register of a late date appears the following from the Parliamentary news:—

FOUL BROOD AMONG BEES BILL.

(Third Reading.)

THE Hon. H. E. Bright moved that the Bill be re-committed, and would read from a note which he had received from Mr. J. Warren, of Mount Crawford:—"I take the liberty of pointing out some grave objections to the above Bill, and suggest an amendment. The 1st and 2nd sections make it punishable to have hives affected with *foul brood* after a week's notice. Under this every beekeeper will be liable to be fined whether his bees are suffering from disease or not. *Foul brood* is being constantly produced in beehives; it is simply the young bee dying in its cell before coming to maturity, just as young birds die in the egg or the young of animals died before parturition. The real disease, according to the best authorities quoted by the advocates of the Bill, is a fungus generated in the decay of the young bees, or otherwise when the quantity is so great as to cause a stench, and is beyond the power of the workers to remove, just as typhoid fever or other disease germs are generated in unclean closets or accumulations of filth. Who would advocate the abolition of closets? Who can prevent addled eggs or death before parturition? The bees will keep their hives clean unless the workers are so weakened by death, starvation, cold, &c., that they are not strong enough to do the work. One of my neighbors placed a frame with a lot of *foul brood* in it in a hive, on looking at it three days after the cells were cleaned out and not a vestige of *foul brood* could be seen. He took the putrid matter from a *foul brood* cell, and put it in cells of virgin comb, and in two hours the matter could not be found. Mr. Tarlton in his speech says—'Mr. Cheshire established very clearly his position that *foul brood* was a misnomer. He said the name *foul brood* given in ignorance of the nature and scope of the malady is manifestly utterly inappropriate; to say a queen bee was suffering from *foul brood* would be as illogical and ridiculous as talking of toothache in the liver. I therefore have proposed the name of *Bacillus alvei*, which has at once been accepted in England and America.' May I suggest that *Bacillus alvei* be substituted for *foul brood* in the Bill, and make provision for punishing people who persist in keeping hives in such a dirty state as likely to breed bacille. If this is done I feel sure few would object to it. It is said there are hives in an unclean state near Mount Barker. If so the Act may be a benefit, but if passed as at present every beekeeper will be liable to be fined, because they cannot control the laws of nature. It will give a handle to inspectors who are not always just, and cannot fail to check the industry, and will meet with the most determined resistance." He only wanted to have the Bill re-committed to carry

out this suggestion, which came from a person who knew what he was writing about. A number of people at Williamstown had told him that if the Bill were passed as it stood they would suffer considerable injury. They made a fair revenue from the industry, and if the disease were so detrimental they surely would only be too anxious to have it suppressed.

The Hon. R. A. Tarlton preferred the popular to the scientific name. He was distinctly of opinion that the effect of the Bill would be to protect the small as well as the large beekeepers. As to getting scientific hives, he believed that they could be obtained for 5s each, so that no injustice, but a great advantage would be the result to the poorer people who kept bees.

The Hon. Dr. Campbell did not think the Latin name ought to be substituted for *foul brood*. The latter was a disease readily definable, but it would be a very difficult and expensive matter to recognise *Bacillus alvei* and if that name were adopted the Act would become inoperative.

The motion having been declared negative, the Hon. H. E. Bright called for a division, which resulted as follows:

Ayes, 5—The Hons. J. H. Angas, J. Bosworth, A. B. Murray, W. Wadham, and H. E. Bright (teller).

Noes, 17—The Chief Secretary, and the Hons. R. C. Baker, W. C. Buik, A. Campbell, W. Copley, J. Dunn, A. Hay, D. Murray, J. Pickering, J. Rankine, M. Salom, H. Scott, W. K. Simms, A. M. Simpson, S. Tomkinson, W. A. E. West-Erskine, and R. A. Tarlton (teller).

Majority of 12 for the Noes.

The bill was then read a third time and passed.

The objections raised to the Bill are based on the supposition that it is a newfangled idea about *foul brood* emanating from newfangled beekeepers who use frame hives, and that legislation in this direction will press heavily on the poor and ignorant beekeeper. No doubt it will press heavily if he have *foul brood*, but the disease will be the hardest master both for him and his neighbors if unchecked. It is just this class of beekeeper that frustrates all efforts to eradicate the disease, and such people have no more right to poison a whole district with *foul-broody* bees than they have to spread scab among their neighbors' flocks, or diphtheria, or small-pox among their children. If they are ignorant of the existence of the disease, the mischief is equally great, and probably greater, and it becomes a social necessity that he should be enlightened and reminded of his responsibilities. We have given instances in these pages of people essaying to keep bees which have afterwards become diseased, leaving the rotting and putrid combs open and spread about to attract all the bees within flight range, and so distribute pestilence in all directions.

We are sure all who desire to see beekeeping flourish in Australia will hail the enactments referred to as a step towards better beekeeping times.

Since our last issue we have seen numerous instances of converting perishing *foul-broody* stocks into healthy and prosperous colonies by the very simple process of removing them from their old hive and comb into a new hive with starters only, and feeding freely if honey is not coming in plentifully. On November 15 we took 28 splendid sections from a hive that in September looked hopeless with the disease. The bees were taken from the hive and combs and put into a clean hive with starters, fed on plain syrup till honey came in freely. They progressed wonderfully, sent off a grand swarm about the 12th November, and are now the best stock in our apiary. Some bees in boxes on the shores of Port Phillip Bay had the disease badly in August. We advised driving them into clean boxes, and burning the old ones. This course was followed with four lots, and these got well filled up, and have swarmed some twice, others thrice, showing the disease has vanished so far. The other affected stocks, however, dwindled away hopelessly, and were wisely destroyed by the owner lest the four now healthy colonies should contract the disease afresh.

THE HONEY MARKET.

THERE is not much demand for extracted or run honey just now, and prices offered are lower than they are likely to be later in the season. The price varies from 2½d. to 6d. or 7d. per lb., according to quality and kind of parcels. Clear extracted honey, in from one to four pound parcels, neatly got up in sealed tins or fancy bottles, command the highest figure. The market is injured by the presence of large parcels of bush honey, that has neither been selected or carefully run, and is generally dirty, turbid, and coarse in flavor. Bush honey, if properly selected and packed, would command as good price as any. Early spring samples we have seen are often strong and acid in flavor, owing to the presence of a large proportion gathered from the Cape weed or Cape marigold, as it is sometimes called; and the flatweed, a yellow flower, something like dandelion, which is now making all our pastures yellow in the early season.

Honey gathered from ti-tree is dark and somewhat strong, with a slightly bitter taste, and although a good wholesome article does not attract, except in cases where its character is known and appreciated.

Eucalyptus honey, especially from the box, red gum, and white gum are the favorites, and stand in the front rank with clover honey. Good samples, properly put up of all these kinds, command the highest prices quoted.

Comb honey is in good demand, especially in 1 lb. or 2 lb. section boxes. Well filled 1 lb. command from 9s. to 11s. per dozen. There is every appearance of an increasing demand for comb honey in this form, and it behoves our beekeepers to devote more attention to the production of section-box honey in the most attractive form, that is clean, well-filled, and completely sealed. We have seen crates of sections on sale which, in England or America, would not be looked at on account of their soiled, broken, dripping condition, yet fetching 9s. or 10s. per dozen wholesale, and retailing readily. A nice, clean white section box, well filled and completely capped, would soon leave the messy samples we refer to in the lurch.

A great mistake is, we are sure, often made by leaving the sections in the hive till they are all filled; for if there is any break in the honey flow, the boxes soon get soiled by the bees continually running over them. Let them be watched during the honey flow, and taken out immediately they are sealed all over, filling up the vacancies by removing partially filled outside sections, and placing fresh section boxes on the outsides, or even simply putting the new boxes where a fitted one has been removed.

Packing and carriage of sample box honey is another point to which apparently little care is given, or they would certainly have a better appearance than most of the samples we have inspected. These little boxes should be packed as carefully for carriage and sale as they are for the bees—always keeping the *right side up*—that is, they should always be in the position they are in when the leakage takes place, and a mess is the result.

Proceedings of Beekeepers' Associations.

BRITISH BEEKEEPERS' ASSOCIATION.

MR. COWAN'S VISIT TO AMERICA.

At the quarterly conversazione of the British Beekeepers' Association, held in London on the 19th of October last, Mr. Cowan, the well-known British apiculturist, presided.

The Rev. Mr. Scott suggested that as the Chairman had very recently paid a visit to North America, where he had seen many of the Canadian gentlemen who were in London last year, and had also inspected some of the largest apiaries in the world, it would be extremely interesting to the beekeepers present if he would kindly describe the wonders he had seen, and also what kind of a reception he had met with from their brethren on the other side of the Atlantic.

The Chairman:—When I came here to-day I was not prepared to make any lengthened statement respecting my journeys in North America, but as it seems to be the general

wish that I should say something on this matter, I shall be very pleased to give you an outline of what I have been doing over there. It is just three months ago since we (my wife and I) started for New York. After a fair passage we landed in that city, where the thermometer registered 99°, which seemed a very high temperature on coming off the ocean. We could not therefore stay in New York, but journeyed north up the Hudson River to Albany. From there the first establishment we visited was that of Messrs. Aspinwall and Ireadwell. These gentlemen are in business together as hive-manufacturers, queen-breeders, and dealers in bees. Their trade is not on a very large scale, but they do a fair amount of business. We stayed a few days with Mr. Aspinwall, who is proprietor of the *Beekeepers' Magazine*, whom I found a most intelligent gentleman, fond of scientific pursuits. I found their appliances are very much the same as ours; and I may here take the opportunity of saying that throughout my wanderings in the States and Canada I noticed that most of the contrivances in use were similar to those adopted by us in England. I have been enabled to carry away a few new ideas; but I feel justified in remarking that we are quite equal to our transatlantic friends as regards hive-making and all the appliances necessary in beekeeping. That which struck me most to the disadvantage of England was our deficiency in pasturage. You would be perfectly astonished to see the thousands and thousands of acres of waste land across the water filled with an abundance of honey-yielding plants, immense quantities of honey being lost owing to the want of bees to collect it. After spending a few days with Mr. Aspinwall, he took me to see Messrs. Knickerbocker and Lock, the queen-raisers in New York State. Mr. Lock is the former editor of the *American Apiculturist*. These gentlemen raise queens in a way very similar to the Alley system, that is, by inserting strips of cells, and destroying every other egg. They rear the queens in the same way, but destroy two eggs for one left, and keep them in very much the same way as he does. From there I went to see the largest beekeeper in the world. Captain Hetherington, who has 2700 hives. He has twenty apiaries, situated at distances of two or three miles apart, in a radius of twelve miles, so that the greatest distance he has to go from home is twelve miles. He and his brother manage the whole of these apiaries, having several men under them; they keep horses and carts, and are hard at work all day long and continue till evening. Business is commenced at 5 o'clock in the morning. I was there during the hours of business and saw all the working. The men go round from hive to hive and take off crates after crates; perhaps a hive has three stories of sections, which are promptly examined, and removed if necessary, and in this way 100 or

150 racks of sections are taken off and carried away. The sections are not removed singly, as we remove them. Captain Hetherington produces the largest quantity of honey in the States. He does not puff himself, and he never writes to any of the papers; in fact, one seldom sees his name appearing anywhere in connection with honey-raising. He is one of the most advanced beekeepers, and the largest producer of honey with the least fuss I have ever seen. He has been at this work for thirty years, always keeping a little ahead of the generality of beekeepers. He is a good business man, and knows how to gratify the popular taste, having no difficulty in selling his honey. He uses sections the same as we do, and also separators. He says it would not answer his purpose to do without separators, as he requires every section to fit into a crate, because there is no time for delicate manipulations, he and his staff working at high pressure from early morning till late at night. Captain Hetherington drove us over to see Mr. Ellwood, who is also an advanced beekeeper, owning 400 hives, and who goes in principally for 2-lb. sections. We also made the acquaintance of Mr. Van Deusen, who makes the beautiful flat-bottomed foundation so well known in this country. From Captain Hetherington's we went to Boston, and other places. As I before explained, we were obliged to direct our steps northward owing to the high temperature. We therefore went to Quebec, Montreal, and other places, regretting that Mr. Pringle was too ill to see us when we stopped at Napanee. At Owen Sound we spent an agreeable time with Mr. McKnight. He has 200 hives of bees, and uses sections without separators. I saw a number of his sections; they looked very nice, but some not quite so even as those that were produced with separators. I found, generally, in Canada that it was the practice to dispense with separators, while in the States they were almost invariably used. The Canadians claim to produce more honey without separators. After spending some time with Mr. McKnight, I went with him to visit Mr. Jones, and saw his works. He is the largest manufacturer of appliances in Canada, and has a 90-horsepower engine working the machinery for the construction of these articles. I was much interested by what I saw there. The business is conducted on a large scale. Hives are made in pieces, and stored away by the hundreds, and are supplied to purchasers by the dozen, the score, or the gross. Cases are made up of ten hives together. In Canada beekeepers work on a large scale, there being very few in a small way of business. They go in for it as a commercial undertaking; and, of course, taking into account the pasturage and the immense extent of their country, they can do so better than we can. While at Mr. Jones' Mr. Cornish came and invited us, and we spent a very pleasant evening together. The journey

from London to Liverpool is only a question of a few hours, but travelling in America from one city to another generally occupies a great many hours. The country is not so populated as ours, and I found it necessary sometimes to make an excursion of 500 or 600 miles from one bee-farm to another. On one occasion I went nearly 1000 miles to see the establishment of one honey-producer and foundation-maker, and that was of Messrs. Dadants', of which I shall say more hereafter. After inspecting Mr. Jones' manufactory, his 400 hives, and his queen-raising arrangements, we went to Lake Superior, and from there through Michigan State to Lansing, where I stayed with Professor Cook. He does not keep bees on a large scale; he is more of a scientific beekeeper, and tries experiments with different hives, the results of each of which are kept separate. His object is to teach entomology and beekeeping to the agricultural students, so as to enable them to commence that pursuit on leaving college. There are about 300 students at this Agricultural College, many of whom are interested in bees. On one afternoon Professor Cook asked me to take his class of about forty students, and I am glad to tell you that by means of my microscope I was enabled to show them some things they had not seen before. They were generally well-educated and intelligent men, who, after leaving the college, go out as farmers. The time spent at the College was most agreeable, the Professor being a charming and sterling man. While there I found my way to Mr. Heddon's; he seemed to me a very intelligent gentleman, very quick to seize an idea and appreciate the experience of others. He showed me his apiaries, although he was unfortunately suffering from bee disease, which affects him in a very peculiar way, namely, by producing catarrh, so that he cannot open a hive himself without being attacked by this complaint. However, as I was there, he showed me how the hives were manipulated, the consequence being that he suffered considerably all the evening. He showed me the handling of the shallow hives, and how easily it was to find the queen. I ascertained that he brought his bees through the winter very unsuccessfully, and had lost as many as from forty to fifty per cent. in wintering. We discussed the merits of the Heddon and Stewarton hives, and in the course of conversation he stated that last year was a very poor honey season, which bore out the complaint of the Canadians who were over here in 1886. I cannot remember what he said was the average produce, but it was not more than 20lbs. a hive at any rate. I found in his district the honey season had been very bad, whilst in some parts of New York State the reverse was the fact, 60lbs. to 80lbs. per hive being an average yield expected; but there were other districts in which not more than 10lbs. to 15lbs. were

obtained. One gentleman (the President of the Michigan Association) jokingly said that no one would believe I had been to the States if I returned to England without boasting about something, and he further said if I came to him I could boast I had seen the apiary where nearly 1lb. of honey per hive had been obtained this year. From Mr. Heddon's I went to Chicago, and met an old friend, Mr. Newman, who showed me over his place, which is in the city. Unfortunately, I did not let him know when I was coming, and, consequently, he was unable to get any beekeepers to meet me, but he was most hospitable, taking me for a five hours' drive through the city, and showing me all the lions of the place. From there I went to see Mr. Dadant. He is a Frenchman, who settled in America some years ago, and, with his son, carries on the business of beekeeping. They also make a large quantity of comb foundation. Last year they turned out 70,000lbs. of foundation, but this year not more than 50,000lbs, as the season had been such a bad one. It is the best natural-based foundation I have seen in America. They melt about 3000lbs. of wax at a time, and in this way are able to get the color uniform. The foundation most in demand in America is the natural-base foundation made on the Van der Voort machine. They also produce a large quantity of extracted honey, and a little comb honey. They work the extracted honey just as we do, by storifying or putting one hive on another. Their hive is a little larger than the Langstroth hive, with supers about six inches deep. These frames are used for extracting. They have 1000 hives now. This year has been a very bad year, they having obtained only 9000lbs. of honey. I think the bad season is demonstrated by the fact that their issue of foundation this year has been 20,000lbs. less than last year's. From the Dadants I went back to Chicago, and spent a little more time at Lansing. From there we travelled on to Toledo to see Dr. Mason. He was out, but he visited me in the evening, and we had a chat about bees and other matters. I found him a very nice, agreeable gentleman, quite well up in bee matters. Mr. Cutting, Secretary of the Michigan Association, who is a very smart and energetic worker in our cause, accompanied him, and I regretted time did not permit me to stay longer to visit them. From Toledo we passed on to Medina, where we saw Mr. Root and his son, Ernest. Mr. Root is the editor of *Gleanings*, and he and his son made our stay there most pleasant. They are both very intelligent and anxious to pick up information. We spent a very agreeable time at Medina. Mr. Root is a very different kind of man to what I had pictured him. He is short, thin, and seems quite worn out with work. He has worked extremely hard, and has succeeded better than anyone else on that side of the ocean in popularising beekeeping and creat-

ing a demand for appliances. He employs 150 hands making nothing but hives and appliances. Everything is turned out on a large scale. He has machinery for doing almost everything, and it was quite a treat going over his large factory and his yard. I met one or two Englishmen employed there, who seemed well satisfied with their lot. I found men hard at work when I visited the manufactory, one making the metal corners for the frames was stamping them out by a very ingenious machine for the purpose. At Mr. Root's, as I had my microscope with me, I was enabled to clear up some points respecting foul brood. He knew all about foul brood practically, but had not been able to make any close investigation of it microscopically. I must tell you that wherever I went I found the microscopes in use inferior to that I had with me. Even Professor Cook had not seen the germs themselves, although he had a mounted slide containing specimens. When I showed him the bacillus under my microscope with a one-twelfth Powell's oil immersion, he was much interested. There was no instrument in the College with such magnifying power. Mr. Root told me he had never before seen foul brood in its different stages. The disease over there is exactly similar to what we have here. From Mr. Root's we went to several other places, Niagara among the number, and afterwards met by invitation the Canadian beekeepers at a large meeting and exhibition of hives and honey in Toronto. The exact quantity of honey exhibited I cannot remember, but the figures were given in the *British Bee Journal*. The exhibits of two hive-manufacturers, the D. A. Jones Company and Messrs. Gould, occupied a great deal of space, but the honey was rather crowded, like the Canadian exhibit here, which militated against the attractiveness of the show. The clover and lime honeys were excellent. As regards the lime honey I think it is superior to ours, the Canadian climate being better suited for its production, but clover honey is as good here as over there. They had an extraordinary, but, to my mind, somewhat objectionable, way of selling honey at the show. A section was cut into four pieces, and each piece offered for sale separately, five cents being charged for a quarter. You would see people distributed all over the show biting at these pieces of comb, and eating it as they walked along. By this method a large quantity of honey was got rid of, but it was not pleasant to see the people pushing about in a crowd and messing each other with the sticky substance. I expressed my opinion at the time to some of the beekeepers, but they assured me it would be impossible to sell the honey at that exhibition on any other plan; and as the all-important object at these shows is to sell the honey, I suppose the custom is likely to continue. At this meeting I had the opportunity of seeing a large number of the Canadian beekeepers.

They came from districts far and wide. Mr. Young, editor of the *Norwegian Bee Journal*, was there at the time, and we were both very hospitably entertained by our Canadian friends. We also met Mr. Holtermann, our Canadian correspondent, Messrs. Pringle, Emigh, Alpaugh, Hall, Rev. W. Clarke, Mr. McPherson, Mr. McKnight, Mr. Corneil, and others. I was honored by the presentation from the beekeepers of Ontario of an address, and also a walking-stick with a gold top, which lies here for your inspection on the table. The address has appeared in the columns of the *Journal*, where the walking-stick cannot be inserted. I am glad to say that everywhere we went in Canada and the States we met with a most hospitable reception. We became on good terms at once, our co-workers over the water doing their best to make our time agreeable; they showed us everything, and our difficulty was to find sufficient time to see all there was to be seen. We might have stayed several days longer at each place, and been made most comfortable and welcome, but it was not practicable under the circumstances. At the Toronto meeting of course I was asked to say something about the B.B.K.A., and I made a special point of describing briefly the working and organisation of the Association. They were very much interested to hear the record of our work and system as they have nothing of the kind over there. Their Associations are merely Associations of beekeepers in certain districts, who meet for the purpose of talking over matters connected with their work. After the pleasant time spent at the Toronto exhibition, we went to see Mr. Hall of Woodstock, Vice-President of the Ontario Association, one of the largest Canadian honey-producers. He has 100 hives, and has produced as much as 200lbs. per hive. Of course he is not able to do that regularly, 50lbs. to 100lbs. being a good average. He makes beekeeping his sole business, and depends on it entirely for a living, as many others do in America. Captain Hetherington is one, for instance; he was a captain in the army during the rebellion. He started beekeeping, and being fond of it, made so great a success that he has managed to live sufficiently well and bring up a family on the proceeds of the business. Mr. Heddon has made beekeeping his only means of subsistence, besides, lately, the editing of a local paper. He had very little money at starting. Mr. Hall was obliged to give up the business he was in owing to bad health, and took to beekeeping as a livelihood. He is bringing up his family upon it. As a business, speaking generally, it answers very well in America. At Mr. Hall's I picked up a great many ideas, but I cannot describe everything on the spur of the moment, having seen so many different things. I shall, however, be able to enter more into detail in the *Bee Journal*. From Mr. Hall's I went with him to Mr. Pettitt,

President of the Ontario Beekeepers' Association. As he was not able to be present at the Toronto meeting, I thought it was only right I should go and see him, and I stayed with him from Saturday to Monday, and spent a very pleasant time there. His hives are very similar to ours, and he has adopted a frame almost the size of our standard, which he finds answers quite as well as the deep frame he had been using. He works with sections of one and three-eighths width without separators. From there Mr. Pettitt accompanied me to see two or three other beekeepers who lived between his place and St. Thomas. One of these, Mr. Alpaugh, a young man, I found to be an advanced beekeeper of great intelligence. He is the inventor of the machine for fixing foundation in sections, which I will show you at work here to-night, and which has been sent by Mr. Corneil. You will see it is an ingenious contrivance, but, unfortunately, I cannot show you the working of it as well as he did himself. From Mr. Pettitt's we went through New York State to Washington, and from there to Philadelphia. In Carpenter's Hall at the latter city, we met with a hearty reception. This Hall is of great historical interest, for it was there that Washington sat, and the first Congress met, and the Declaration of Independence was signed. At Philadelphia we made the acquaintance of several scientific beekeepers. I believe there are more scientific beekeepers in Pennsylvania than in any other part of the States. Dr. Townsend is President of the Association. Mrs. Thomas, who goes in actively for beekeeping there, asked if we had any lady beekeepers in England. On my replying "yes," she said we ought to make more of that fact in the *Bee Journal*, because such notices would stimulate other ladies to undertake the same pursuit. Although it might do in America, beekeeping on a large scale was not suitable for ladies in England (laughter). This may appear strange, but there is, undoubtedly, a difference between the mode of life led by ladies in America and in this country. American ladies are used to hard work. In every household every lady does her share of work as much as the man does, and performs her part of the household duties. There is a great difficulty in getting servants there, and she has to do cooking, sweep the rooms, or dust the furniture. Gentlemen also assist in the household duties, sometimes cleaning the boots. You will, therefore, see that what American ladies might do ours could not. I must not forget to acknowledge our indebtedness to Dr. Townsend, Mrs. Thomas, and Mr. Arthur Todd for their kindness. The latter gentleman took us about and showed us everything of interest in Philadelphia. It was there I met our friend, Mr. Hooker's son, who also kindly showed us about. From there we travelled back to New York, and across the ocean home. I am afraid in the foregoing re-

marks I have only given you a slight idea of what we saw and did and the districts we have travelled over, but the pages of the *Bee Journal* shall give you fuller particulars from time to time. Wherever I took my microscope it was a source of great interest and delight, and the preparations were attentively examined. I have already told you how hospitably we were received everywhere in the States and Canada. All beekeepers seemed pleased to meet me, not only as a brother beekeeper, but as the representative of the beekeepers of this country. I assured them that the compliments paid to me would be appreciated by the members of our Associations here, and I can now only repeat my expression of thanks for all the kindnesses I received on the other side of the Atlantic. Our trip was a very enjoyable one, although travelling is not so easy there as here, and one becomes wearied by the long distances. Of course, my wife could not bear the fatigue of accompanying me everywhere. Accommodation is not so good there as here; sometimes, in out-of-the-way places, we have had to sleep on the floor, owing to unwelcome bed-fellows. In conclusion, let me say I shall be happy to give you any further information in my power, if you will ask me questions on any specific points. (Loud and protracted cheering.)*

In reply to questions by Mr. Meggy, the Rev. Mr. Clay, Mr. Garratt, and Mr. Lyon, the Chairman said that Captain Hetherington's bees were Italians, or crosses between them and black bees. Large honey-producers like the Captain raised their own queens, and did not deal with queen-raisers, because where an extensive business was done queens were wanted by the dozen. It was found by experience that Italian bees, or a cross between them and black bees, were best suited to the American climate, at any rate in that district. Carniolan bees were being introduced in some places, but not largely. It was the practice always to select queens from the best stocks. All the sales at the show were retail. A large quantity of honey was sold by producers to the stores in the neighborhood. The only place where he had examined foul brood was at Mr. Root's.

Mr. Lyon asked what was the average price per lb. of honey paid to producers, because he thought, considering the market price of Canadian honey in this country, a beekeeper over there who only had 400 hives could not make a very good living.

The Chairman replied that the usual price was from fourpence to eightpence per lb. Mr. Hall had a very bad season last year, but as a rule he made a good living by beekeeping.

* The above outline of Mr. Cowan's travels through the States and Canada, and his narrative of visits paid to beekeepers, were delivered without the aid of notes, and with little previous preparation, which must be his apology for any possible omission or misstatements.

In reply to the Rev. Mr. Raynor, the Chairman said that Captain Hetherington always introduced his queens by means of a cage very similar to the pipe-cover cage. The Captain said it would not pay him to practice direct introduction. He must make sure of introducing every queen successfully. He had tried the direct method, but had lost so many queens thereby that he could not afford to waste any more time by experiments. The question was governed entirely by cents and dollars, and every day was of consequence. One gentleman he (the Chairman) met who frequently tried direct introduction, and by taking the precaution to smoke the bees and the queen, and thus give them all the same scent, had been successful.

In answer to Mr. Grimshaw and Mr. Garratt the Chairman said that Captain Hetherington used a different smoker to those employed here. A fire was lit in the American smoker, which sent out an immense quantity of smoke. He (the Chairman) had been present during the manipulation by Captain Hetherington. That gentleman would not allow any of his friends to be present on such occasions unless veiled. A tremendous puff of smoke was blown into the sections, which caused the bees to rush down, and crate after crate was removed in that way—a work occupying only a few moments. Very few bees were killed or taken away, perhaps not more than two or three. The wood used in the smoker was maple cut out into pieces about four inches long and half an inch square. Some people, like Mr. Heddon, used moistened plane-shavings mixed with dry shavings, which combination smoldered very much and gave off a considerable amount of smoke and steam. In every apiary there was always a smoker ready at hand. He (the speaker) took the opportunity of testing Mr. Grimshaw's apifuge at Messrs. Knickerbocker and Lock's. Mr. Lock put some on his face and hands when examining a hive of savage Cyprians. One bee flew direct at his face, but did not sting, at which Mr. Lock was agreeably surprised. He (the Chairman) left some of the apifuge with several persons.

In reply to Mr. Sambels, the Chairman said that sections in America were propolised late in the season just as much as here, but early in the season the honey flow there was very rapid, and they were consequently not propolised so much. Captain Hetherington considered seventy pounds per colony a very fair yield. With regard to carrying bees away on the sections he had omitted to say that every establishment had its honey house, and the windows in these were so arranged that bees taken in could get out again. In America, however, they were not so particular about destroying a few bees as we were, so long as time was saved. They do not trouble to remove the sections as carefully as we do, and with them it is of no consequence to crush a few bees. Wintering in Canada is much easier

than in the States, owing to the dryness and equable temperature. The climate of the former is colder, but less changeable than that of the States. Captain Hetherington's greatest difficulty was in wintering. He moved all his hives into cellars, but his losses during the spring had been great. He had lost as many as ninety per cent. some years and could not ascertain the cause. He had a house built partly above and partly below ground, which was ventilated by a pipe running a long distance under ground, the air inside the building being warmed to the temperature of the earth. That gentleman's apiaries were in New York State and occupied a very cold region; in fact, they existed in a snow belt which extended for about fifty miles north and south. The district seemed always to be visited with a larger quantity of snow than was experienced either north or south of it for many thousands of miles. Melons would not thrive in that belt, though they come to perfection both north and south of it. In Iowa and Illinois bees can be wintered out of doors.

The Rev. Mr. Raynor said he thought the meeting was deeply indebted to Mr. Cowan for the very lucid and interesting description of apiculture as carried on across the Atlantic with which he had favored them that evening, and he (Mr. Raynor) wished to express on behalf of his brethren their heartfelt thanks to the Chairman. He was glad to know that, with the exception of pasturage, beekeepers here were in every way equal to their co-workers in America.

The Hon. and Rev. Henry Bligh seconded the motion, which, upon the suggestion of Mr. Garratt, was formulated thus:—

"That this meeting expresses its best thanks to Mr. Cowan for his kind and lucid description of American Apiculture in the United States and Canada, and also desires to record its sense of the kindness and hospitality shown to him as the representative of British Beekeepers by American and Canadian beekeepers."

colonies should be very strong and almost ready to swarm. Combs should be well filled with hatching brood, as the young bees are our main dependence in making divisions, as a large number of the old bees will go back to the old stand from which we have made our divisions. The manner in which to divide consists in taking as many parts from one colony as we think proper. From one strong colony we can take from one to five or more. But we think it best not to get our stocks too weak, and would make but one division from each colony at a time, and always supplying the queenless half with a young laying queen. By this method our colonies will soon become strong again, and hence we make the second division, and so on. By this means we keep colonies strong enough to store a considerable amount of surplus honey, and at the same time increase very rapidly.

The great drawback in dividing is that we do not get the bees evenly divided as to age. The old bees will leave the new colony just formed, and go back to the old stand, and in order to get enough bees in the new colony we must take frames from the old stand, with adhering bees, and shake them into the new colony, and those bees that remain are all young bees. Hence we get all the old bees at the old stand and all the young bees at the new stand, and our new colony will not commence work for several days on account of the old bees, or working force, being all at the old stand. This is not the case in swarming, as all classes and all ages come out with the swarm. This is why we prefer first swarms, and have written so much on the care of them. Second swarms do not come with so much regularity as first swarms, and we think dividing preferable to second swarms.—*Queenslander.*

Original Contributions.

AN INTERESTING ADVENTURE WITH A YOUNG QUEEN.

A stock of Italian bees had swarmed the last day of September, and all but one queen cell was cut out. On the 19th October it was noticed that the bees were clustering outside as if preparing for swarming again. On examining the hive (which had a super with frames for extracting, and a queen-excluding zinc honey-board) no queen could be found, and neither brood or eggs could be seen. It was concluded that the young queen whose cell was still there and cleanly opened had hatched and been lost when out for mating. The super and frames were removed to a shed about a hundred yards away from the hive and arrangements made to introduce a new queen at once. It was noticed that a good many bees were flying to the super and thinking robbing was commencing, the frames were taken out to be put out of the way in the bee-

Extracts from Foreign Journals.

DIVIDING BEES.

If we wish to increase our stock of bees by dividing we must begin preparations early in the season, by forming *nuclei* for queen-rearing, in order to have a supply of queens to introduce to our extra divisions. In starting *nuclei* for queen-rearing early in the season we think it better to sacrifice full colonies for the purpose, rather than to draw from a large number of colonies, as it tends to weaken them so as to be quite a while in gathering up to their former strength. And by this method we have the advantage of having our queen-cell built in full colonies, by simply taking away the queen. To make dividing a success

hous. Mr. Lloyd, who was assisting, exclaimed as he lifted one of the frames "why here's the queen," she had evidently got through the zinc honey-board soon after hatching and was by reason of her increasing size unable to get back and hence the unsettled state of the bees and their clustering outside.

The queen was at once caged and taken to the hive and released at the entrance; instead of entering she flew away, watch was kept at the entrance expecting her to return, but she did not do so, and it was feared she was lost. I suggested however, looking again in the super where she was found quietly feeding on one of the frames. In trying to cage her, she again took wing and got away through a partly open window in the beehouse, but was immediately afterwards found in the super in the shed which was at some distance from the window through which she escaped. This time super and frames, with the queen were taken and replaced on the hive after removing the zinc honey-board. The bees at once quieted down and went to work. The interesting points in connection with this experience are—

1st It is possible for a young queen to be trapped in a super with a zinc excluding honey-board, but whether before fertilisation in this case or not cannot well be ascertained.

2nd. How did this young queen find her way back to the super in the shed, when she was released from her cage at the hive entrance a hundred yards distant; and again, how did she find her way back again a second time when she escaped through the beehouse window. She was strange to both localities, but was taken from the super in the shed each time on a comb into the beehouse for caging. The puzzle is, by what knowledge or instinct did she get back to the super each time? This is somewhat at variance with accepted theories.

Correspondence.

CYPRIONS OR ITALIANS.

ABOUT four years ago I made the statement in the Australian Press that the time was not far, when, besides Italian bees, many others will be named and prized as the best, although nothing else be known about them but their name. This time has already arrived. Carniolians were the first lot, and how they were prized! Now we hear no more about them. Cyprians came next, but as there appears a probability of their reputation going the same way as the Carniolians, there just comes an account from Mr. Benton: Cyprians—*ne plus ultra*. The right cannot be denied to Mr. Benton to believe the Cyprians the best bees, but by far the greatest majority of beekeepers give this place to the Italians, and it requires better proofs than hitherto obtained from the Cyprians to make them believe in the latter

as they do in the Italians. Cyprians have been tried by many able beekeepers, but they could not secure the estimation which the Italians rapidly gained in every country. We have no Cyprians here, and the few queens that were ordered some time ago by a gentleman from this district died before they reached the ocean, and I felt thankful when reading of this. "Woe betide the luckless Italian or German (common black) colony that Cyprians take it into their heads to rob!" Good Gracious! I hope the number of Cyprians in Australia is very, very small. I pity those who keep a Cyprian colony amongst a number of Italians or Blacks, as there is no telling when the former will take it into their heads to rob, and when they do, look out for mischief. If Mr. Benton would state his proofs (not by the thousand though) in the *Eichstädler Bienenzeitung*, German beekeepers could reply, and explain the faults they have found in this race of bees.

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JANUARY 10, 1888.

[PRICE 6D.

Editorial.

HINTS FOR FEBRUARY.

FEBRUARY in Australia often yields a good honey harvest from Eucalyptus and other late flowering trees, and from clover, &c. in moist localities. Honey collected in February, March and April is generally finer than that gathered in the Spring and early Summer months.

As very much depends on the season as well as the locality, it is advisable to watch our friends pretty closely, and give more storage room immediately they are found to be bringing in honey. The advice given for last month as regards managing sections and extracting should be adhered to.

In ordinary seasons breeding will now have diminished, and be almost at a minimum, and although a good honey-flow may bring about an increased activity of the queen in this direction, our experience has shown us that in all strong colonies very little brood space is occupied after February, and all cells used in the earlier part of the season for brood are now filled up with honey. If we are working for section-honey, therefore, it is best to contract the brood nest to 8, or even 6 combs, so as to compel the bees to store in the sections instead of the outside combs. If, on the other hand, one is working for extracted honey, allow them to fill up the outside frames, and extract as soon as the comb is full without waiting for sealing up. By this plan extracting can be done more rapidly and cleanly without much trouble in uncapping; at the same time the honey will ripen quickly if left in an open vessel (with a bee and ant proof wire net cover over it) because the air is generally so dry in February that evaporation of water from the honey takes place very quickly.

It is well to do any uniting or joining-up of stocks before February, so as to concentrate

our forces upon any honey-flow that may occur. In January, February, and March large amounts of honey are obtained in our forests on the mountain sides, and from clearings laid down in clover; it is quite possible, therefore, for beekeepers to adopt the plan followed in England, Scotland, and many parts of the Continent, that is, to move their bees from a locality favorable for Spring and Summer bee pasture to localities rich in late Summer and Autumn pasture.

Although in many localities February will yield a good harvest, it often becomes necessary to feed in this month, and the careful beekeeper will keep a sharp look-out that every stock has a fair supply of food, and will at once commence to feed as soon as he sees evidence of failing stores.

ITALIAN QUEENS FROM KANGAROO ISLAND.

THE action taken by the Government of South Australia with regard to Kangaroo Island in connection with the apicultural industry, by the prohibition of the introduction on that Island of any bees except the pure Ligurian or Italian, in order to keep up the purity of the imported race, is already bearing fruit, and promises to be a success, and a great practical advantage to beekeepers.

The great difficulty in apiculture is to secure the mating of young queens from imported mothers with the true Italian Drone, and it is almost impossible to attain this under ordinary circumstances, without very great trouble and considerable care. If, however, a locality can be found where no Black or Hybrid bees exist, a beekeeper can make sure of his young queens mating only with his own selected drones. In a former number of this Journal, page 120 and 121, vol. i.; an account is given of what has been done

to constitute Kangaroo Island a locality possessing this advantage, and this season we have received some young queens, reared and mated on the Island, from the apiary of Mr. Fiebig, of Pirie Street, Adelaide, which are proving to be in every respect equal as regards gentleness, beauty, prolificness, and other good qualities, to the queens we obtained from that beemaster last year, than which, we desire no better.

The price at which these queens are now offered, will place the introduction of pure Italian stock within reach of almost every beekeeper; for there is no longer any doubt that the Ligurian or Italian is *par excellence* the best bee for Australia.

ITALIAN BEES AND ITALIANISING.

As many of our readers enquire about the best mode of obtaining pure Italian bees, and the cost of a colony of Italians, we think it desirable to give all the information we can on the subject in the pages of our Journal. A hive of Italian bees can be obtained from almost any dealer in apicultural supplies; many of whom will be found to advertise on the cover of this, and previous numbers, the price varying from 30s. to 60s., or 80s., according to the kind of hive, quality of the queen, and strength of the colony.

We do not, however, recommend the purchase of Italian colonies to those who adopt beekeeping for profit. The proper course is to purchase a good Italian Queen, costing from 15s. to 40s., (we see Kangaroo Island Queens advertised for 15s. in the Journal) and introduce it to a good strong and healthy colony of common bees. In a month the hive will be teeming with young Italian bees, and in three months nearly the whole stock will consist of pure-bred, yellow-banded Ligurians.

It must be borne in mind that it is a difficult matter to keep up a pure breed of Italian bees, except in certain localities where no black bees exist, for, the first time the Italian colony sends off a swarm, the queen goes out with it, leaving queen cells, containing pure-bred young queens; but there are very many chances to one against these young queens mating with pure Italian Drones, unless very careful precautions are taken. Indeed, it almost seems as if young Italian Queens are determined to mate with black drones if possible, and an apiary of six or ten hives, all pure Italian, at the beginning of the swarming season will, at the end of it, show most of the new stock to have fallen off into Hybrids, and, if these Hybrids swarm, the progeny of the young queens will be found to have returned a long way towards blacks. Nevertheless, the introduction of the Ligurian blood will be found of immense advantage in improving the working and breeding capacity of the bees, as well as their hardiness.

To keep up a pure breed necessitates furnishing every hive that has swarmed with a purely-mated queen, and such queens must be purchased, unless bred by the beekeeper himself, and precautions taken to secure their mating with Italian Drones. The methods of rearing pure Italian Queens will be described in a future article.

Let us now describe the method of introducing an Italian Queen to a stock of common bees. There are numerous plans advocated, but in all the first step necessary is to find, and remove or destroy, the queen already in the hive. In a frame hive this is not difficult if one is accustomed to see the queen, still it requires a careful watch and sharp eyes to find a Black Queen in a crowded colony. If the queen cannot be found by searching the frames and inside the box, the best way is to move the hive from its stand, put an empty one in its place, spread a white sheet with one end stretched over the bottom board of the temporary hive, which must be raised a little in front to allow the bees to enter freely; now take the frames one by one from the full hive and shake the bees from them on to the cloth in front of the empty hive, and by carefully watching the bees as they march up the sheet to get under cover, the queen can be easily discovered and caught. If not required, destroy her at once, but if likely to be wanted, place her in a queen cage. The bees will now be mostly in the temporary hive. The frames from which the bees were shaken having been replaced in their own hive, that hive must now be put back on its own stand, and the bees shaken from the temporary one back among the frames, and any bees still adhering to the temporary box will soon get back to their old home.

The bees, being now queenless, will, as soon as they are aware of the fact, get restless, and will run about over the hive in an excited manner, looking for the queen, and the best time to introduce the new queen will be towards sunset the same evening; of course it is necessary to see that there are no queen cells built, and if there are, they must be destroyed. In No. 3 of the present volume, page 35, we described a queen cage we have used very successfully for introducing, and which is, indeed, Alley's Combination Cage slightly modified. If the new queen be placed in this cage, and the cage itself laid on the top of the frames under the mat with the feed hole open, the bees will soon release the queen, and accept her.

Many beekeepers prefer what is known as the Pipe-cover Cage, which is a piece of wire net (about twelve to the inch) 2 inches wide, and 3½ long, rolled up on a piece of round broomstick, about an inch diameter. One end of the wire net is bent over all round, so as to close up an end, and the ends so pressed over can be secured and made smooth with a little melted wax. You thus have a wire net

cylinder closed at one end, and about $1\frac{1}{2}$ inches long; now unravel about five or six wires that run around the bottom, which will leave a ring of spikes at the bottom easily forced into the comb. This forms the Pipe-cover Cage. Take a piece of card, and, having got the queen in the cage, slip the card under it to confine her; place the card and cage on one of the combs over open cells of honey, slide out the card, and press the projecting wires of the cage well into the combs. The queen is thus imprisoned in the cage over a good supply of food; the bees can get around about her, and if they take to her, will soon commence to feed her. In 24 hours partly lift out the frame very quietly, and if the bees are not clustered around the cage it may be gently lifted, and the queen allowed to walk out among the bees. If, however, the bees surround the cage thickly, and seem excited, wait another 24 hours before releasing the queen; in short, do not release her till you find the bees are taking very little notice of her, or they will probably attack and sting her, when she either dies or becomes useless. The various cages recommended for introducing queens are rather numerous, but we prefer the Alley, or if that is not at hand, the *wire Pipe-cover Cage* just described. We have never failed with the Alley Cage.

Expert beekeepers frequently introduce queens directly without caging, but then certain precautions prompted by experience are necessary. The most important ones being that the queen to be introduced should be hungry and not excited, and that the bees themselves should be undisturbed. For instance, the new queen is kept in a cage for 30 minutes without food, and then very quietly allowed to run in under the mat at the top of the frames with no more disturbance of the hive than is necessary to take off the cover very gently, and raise one corner of the mat. This is best done near sunset.

The elements of success in queen introduction are—

1st. Queenlessness and absence of queen cells.

2nd. A quiet, unexcited queen.

3rd. An undisturbed colony of bees.

And, although queens are often safely introduced by thoroughly smoking the bees and allowing Her Majesty to run in among her gorging subjects, we believe the quieting method the best, and it is because the queen makes her escape from Alley's Cage when everything about the hive is quiet that renders that method of introduction so universally successful. (To be continued.)

BEE HIVES.

THE BUSH HIVE.

We have tried a new, cheap hive, made by L. T. Chambers (formerly of Adelaide, and now of 18 Franklin Street, Melbourne), which he

calls the Bush Hive. It is a very simple arrangement for holding 8 or 9 of the Standard Langstroth frames, with bottom board and cover alike and interchangeable. The chief features of the hive are:—

1st. It is narrower than the ordinary Langstroth hive, as it will only hold 9 frames, or 8 frames and a dummy. The hive is higher by about 2 inches than the ordinary hive, and the rabbets, on which the frames rest, are about 2 inches below the top edge.

2nd. The entrance is the whole width of the hive, and is formed by the front end board being $\frac{1}{4}$ -inch shorter than the back one, so that when the sides and ends are nailed together flush at the upper edge, the $\frac{1}{4}$ -inch entrance space is left the whole width of the front at the bottom.

3rd. The bottom boards and covers are exactly alike and interchangeable, and are simply flat boards strongly cleated.

4th. In supering, a crate of sections is made to fit inside the hive above the frames; and, as the sides of the hive stand 2 inches above the tops of the frames, the crate will be higher than the hive by nearly that amount, and a shallow frame, the same size as the hive, is made to fit on so as to raise the cover clear of the crate of sections.

5th. The front board of the hive is grooved out, and a thin board fitted in the whole width of the hive, to form a kind of shelter or porch over the entrance.

The advantages claimed are simplicity, cheapness, and portability.

Our experience of this hive is very favorable. Eight frames is, in our opinion, the right number, and ten too many where supering for surplus is practised. The sides and ends of the hive, projecting 2 inches above the frames, appeared to us at first objectionable for many reasons; but we find manipulation quite as easy, and perhaps more comfortable than when frame tops are level with the top of the hive; and what is certainly a substantial advantage, the bees do not "boil over" the edge when manipulating, and there is no fear of crushing them in replacing the cover—they *boil up* inside, but do not *boil over*. It is a capital hive for packing, and sending by rail or carrier.

IMPROVED BOX HIVE.

Until a frame hive can be got for half-a-crown, some beekeepers will stick to gin cases, soap boxes, &c. as their pet houses for their bees. Still there is a very considerable room for improvement between a red or blue gin case and a nicely made frame hive, and a considerable difference in the cost—say from eighteen pence to twelve or fifteen shillings.

I have made some experiments during the present season, which have proved encouraging. Several boxes were made exactly alike, that is about 14 inches by $13\frac{1}{4}$ inside, and 10 inches high, no bottoms or tops, so that they were

scarcely boxes. Two strips were nailed about $\frac{1}{4}$ an inch down from the top on the two 13 $\frac{1}{2}$ sides, there formed a resting place for 9 strips of lath, from half inch to $\frac{3}{4}$ wide, cut the right length to go inside the box and rest on the strips. To one side of each lath I fixed a strip of foundation a quarter inch wide by means of melted wax, and then with small brads lightly fastened each lath in position on the strips so that the laths were parallel with the sides of the box, and spaced so as to be $1\frac{1}{2}$ inches from centre to centre. The laths were a little over a quarter of an inch thick, so that when they were nailed down they were about $\frac{3}{16}$ below top edge of hive. To form an entrance to the box cut out from bottom of front (or side as preferred) a notch 6 inches long and $\frac{1}{2}$ inch wide. Any piece of flat board will do for bottom board, and same for cover. I placed a swarm in one of these boxes in November, the bees soon filled up with fine, straight, parallel combs, guided by the laths and narrow strips of wax, and, as there was just $\frac{3}{16}$ of an inch between the tops of the laths and the cover, it gives the bees just room to move about, and not room for comb building. I could take off the cover and see down between the combs which were all solidly fixed to the sides of the box. With a little smoke and a good shake I tumbled most of the bees out on a sheet and sighted the queen. As soon as they all returned I put on a similar box with 21 1-lb. sections with starters of foundation which are filling up. There is room for 42 section-boxes in two tiers. I propose to try another for bell glass honey, by removing the cover, putting on a second box, and place a bell glass on the frames for comb honey: or we may have the second box with laths like the first, and allow the bees to fill up; at the end of the season the top box which will generally contain honey only and can be removed and the robbing performed without disturbing the brood chamber beneath. The cost of these boxes without laths or wax would be about 1s. 6d. each; the wax for nine frames costs about 4d., the labor, laths and nails need scarcely be counted, while the bottom boards and covers can be made out of any old boxes or cases if the cost of purchasing them, say about 1s., is prohibitive.

If box-hive beekeepers were to adopt a similar plan I am sure it would be found to pay, inasmuch as better produce and better prices would result. Too close robbing with starving and diseased bees would be prevented, and the operation of "driving" easily and safely performed, while the beekeeper would have the option of obtaining his surplus in the shape of comb honey in the most saleable form, and the cost of the boxes would scarcely, if at all, exceed the amount paid for all kinds of odds and ends of dirty, thin and leaky packing cases.

The boxes could be got in the flat from the timber yard ready to nail up, and in that shape are very convenient for carriage indeed. I

believe if there ever was a demand for such bee boxes they could be made up—laths, wax, strips, and all for less than the amount I have quoted.

(To be continued).

THE AUSTRALASIAN BEE JOURNAL.

We have just received the January number of this periodical, and we are glad to learn from its pages that the New Zealand Beekeepers' Association is likely to be resuscitated, for there can be no doubt that more good is done, and more progress in the art of Apiculture accomplished by association, than in any other way, the publication of a Bee Journal not excepted. It is true that a great many country members cannot avail themselves of town meetings, but, then they should form small district or local branches, as advised at a late meeting of the Victorian Beekeepers' Association, when more good still would accrue. If, further, the publication of the local Journal could be under the auspices of the Association, and members be given certain privileges, such as a lower subscription, much would be done towards binding together beekeepers throughout New Zealand.

The pages of the present number are full of interest and useful information, and we are pleased to find its Editor on our side as regards "Foul Brood," and the modes of dealing with it.

We observe a correspondent refers to a proposition made at the Victorian Beekeepers' Association that an endeavor should be made to get up an Apicultural Court at the coming Melbourne Exhibition (as was done at the Indian and Colonial last year in London), in which all the Australian exhibits of honey, bees, and appliances should be gathered together for comparison, and he objects to the suggestion because, he says, "it will do away with competition." He fails, we think, to see that by bringing the exhibits side by side, comparisons can be more easily and critically made than if there was a small exhibit in the New Zealand Court, and others in each of the different colonies. This spreading out of what at most will not be a very extensive class will kill real competition, while a collective exhibit would attract an immensely greater attention, as it did in London, and put a keenness on the competitive character which could not otherwise be obtained. We sincerely wish our New Zealand contemporary a prosperous year, and an increasing subscription list.

"How do You pronounce s-t-i-n-g-y?" asked Prof. Comstock. The smart bad boy nearest the foot of the class stood up and said, "It depends a great deal whether the word is applied to a man or a bee; one is sting-y, and the other is sting-y. "Go to the head, young fellow."

Correspondence.

YOUR last number reached me just at a time I was considering about uniting some weak lots of bees that swarmed early in October. I was glad to see the paper about uniting, for I was a little timid about the job, as I saw some uniting done up near Wangaratta last year, when fully half the bees were killed soon afterwards, and were fighting for nearly two days.

I thought I would try the combs placed alternately as recommended. I took the queen out of one stock and brought the one with a queen in up to it in the evening, and put the combs, bees, and all into the hive without a queen, and gave them a good smoking with my pipe. I took care to have the combs first of one hive and then of another. Many settled down, and not a bee was killed. Next day a good lot went back to the stand of the hive, where I had put the old hive and a frame of comb. I shook these among the united ones in the evening, giving them a few puffs from my pipe; next evening there were about a dozen bees went back, which I left, and expect they all found their way to their new home next day.

I send you these particulars to show you that the plan you advised succeeded well with me, and I intend doing the same whenever I want to join any more lots together. Thanking you for your good advice, I am, &c.,

BUSHMAN.

Kilmore, Dec. 29.

Original Contributions.

FIXING FOUNDATIONS IN WIRED FRAMES.

FOUNDATION fixed in wired frames by any of the methods adopted, whether it be the galvanic battery, the spur embedders, or other plans, is very apt to buckle and get out of shape when put into a warm hive. The fact is the wax sheet permanently expands when warmed to a moderately high temperature, such as exists in a strong healthy hive. This buckling leads to wavy and ridgy combs, difficult to uncap for extracting and also encourages the formation of brace combs. It can be avoided by making the foundation quite warm and soft while fixing it to the wires; the foundation will contract on cooling and draw the wires a little together, but will keep nice and straight when expanded by the heat of the hive. The wires should not be drawn quite tight in the frames.

THE BEES' FOOD.

HONEY gathered by the busy bees from the nectaries of the flowers and stored in their wonderfully made cells is the important product for which such great interest is taken in

apiculture. No other living creature is able to fulfil this design of Nature, no manufactured substance is equal to honey. The consumer should know the difference between syrup or manufactured honey and pure bee honey. The manufactured article proves unwholesome to the consumer, and if it is sold under the assumed name of honey, it injures the market for honey and its reputation. Should a tradesman be found out mixing glucose with honey and selling it as pure honey, he would, no doubt, be denounced by every beekeeper, and justly so. But what about those beekeepers who themselves feed their bees on sugar syrup? Too much space has lately been taken up in the different Australian Journals advocating feeding bees on sugar syrup, and I cannot help stepping forward and if possible stop such bad advice. Sugar is not honey, not at all equal to it. Bees should not be fed on sugar syrup; whoever feeds this substance makes himself very nearly liable to a prosecution for adulteration of honey. It strikes me that those who advise feeding sugar syrup, complain about the low honey price, that it is mixed, &c., and that something ought to be done to stop adulteration, and that honey should be used for this or that instead of sugar. So it could, no doubt, but the idea did not strike them that they contradict themselves and work into the pockets of the sugar growers. If a beekeeper finds syrup equal to honey, why, anyone must admit that it matters little whether the mixture comes from him through his bees, or from a tradesman outside of the bee line, the latter being less to blame than the former; but the consumer loses his confidence in honey. Feeding the bees on syrup brings the honey into discredit. The food is not all used at once, it is stored in the cells like honey, and when afterwards plenty of honey can be gathered and extracting begins, the food is mixed with the honey, it cannot be separated and will be disposed of as pure honey. An analysis would prove this, and what then? Further, if anyone finds that feeding on syrup answers well for one purpose, who warrants that he will not feed this substance at any time and thus secure a large crop which he will sell as pure honey. Or do the bees transform syrup into honey? If so, we had better go headlong into this method, spare our bees the trouble to gather the nectar of the flowers and help the sugar industry. Syrup has sometimes a bad effect on the bees, it may cause diseases, as foul-brood, &c. Bees gather honey and they should live on honey. It is the beekeepers' duty to feed honey if feeding is needed.

In English and German Bee Journals we find a lot of directions how to feed the bees on syrup, &c., and from them the advice found its way to Australia—another proof how out of place copies from foreign journals sometimes prove. The climate of Northern Europe is quite

different to this, and it is not favorable for honey production, while the season is short and sometimes an absolute failure. To keep the bees alive there means feeding them, and to feed them on honey means a great outlay, as the honey is high in price. The winter is long and the consumption of food great, so when feeding is necessary and sugar is chosen as food this cannot effect adulteration of honey to such an extent as it would here. While there, feeding is a necessity incurred by bad weather and long winters, it is quite different here. Although in this beautiful country with its sunny summers, and its absolute mild winters, times may come which make it necessary to feed our bees for a short period, we need not rest on syrup as our only remedy. Generally some districts are more fortunate than others, and then the honey is so cheap that it is within the reach of everyone to buy it and give to his dear little insects who will repay his devoted attention with great interest. But can anyone cite an instance where his fellow-beeman bought honey of him to feed bees? And if not, why not? We have now Associations in every colony, surely their members will help one another, and one Association another, if help is wanted. We can always obtain honey enough to feed bees with, and we open a new field for our product, while our credit remains secure and safe.

A few words more and I have done with this lot. Is it not very often the beekeepers' own fault that his bees require feeding? Has not he deprived them of their stores so that feeding becomes a consequence of his greediness? My friends, mind what you do and consider the results.

W. ABRAM, Manager.

Italian Bee Company, Parramatta, N.S.W.

News and Reports from Colonial Apiaries.

NARRACOORTE, S.A.

COMMENCED beekeeping last April twelve-months with two colonies, but by obtaining bees from the bush, and swarms, increased to 18 colonies by 1st December, 1887. Since about middle of October, 1887, have obtained 1040 lbs. of extracted honey; have not worked for comb honey, as demand is limited. Keep Italians and Hybrids, obtaining two Queens from Adelaide and breeding my own Hybrids. Use the Langstroth Hive, and tier up to three stories. The forage runs as follows:—August, almond blossoms, then Cape marigold; September, Cape marigold, garden flowers and Cape broom; October, Cape broom, Cape marigold, and towards end of month a species of white gum (this tree flowers every other year blossoming when the red gums do not); November, white gum and garden flowers; December, red gums (*E. Rostrata*), but this year, very sparsely; January and February,

red gum, then "prickly bush." This shrubby tree bears a pale yellow cluster of flowers, the flowers being very small, but contain an immense quantity of honey. It lasts till about the middle of February. The honey has a nasty, bitter taste, savoring of Venice turpentine, and has a strong odour. It is unsaleable. From the middle of February till end of March there is a dearth of honey. Towards the end of March the honeysuckle (*Banksia Ornata*) comes out, producing a nice, mild honey, very clear, and with it ti-tree. This ti-tree is unlike the Victorian ti-tree, and bears a bottle-brush flower of a pale yellow, a good honey flower. April and May give us honeysuckle, stringybark and white gum (*E. Leucocorylon*). The stringy-barks up here are a different species to those in the Western District of Victoria. The white gum bears a large seed, but singly on the twig, one white and another pink (two different species of course). June and July, blue gum, but not the *E. Globulus*. This tree is called the "blue gum" because the trees have leaves of a bluish color when very young. I don't know what sort of a honey producer it is, as it is out of my range, but it blossoms profusely. Sorry to have to report that we have foul brood up here. It was introduced from Mitcham, near Adelaide, with a hive of Italians, and has got a good hold on the bees about here. Don't think our Foul Brood Act will be workable, for, how is an inspector to find out a mild case of foul brood in a Skep Hive? Very few have gone in for the Langstroth Hives this way, all count them as too much bother. I may add that Narracoorte is situated within 13 miles of the Victorian Border, about 20 miles due-west of Apsley, and 75 miles north-west of Casterton. In Adelaide honey brings from 2½d. to 3½d., the latter price for best samples.

F. PRICE.

OUR OWN APIARY.

THE season is one of the most remarkable on record for increase, and swarming has been going on perpetually since the end of September. Commencing the season with eight stocks we have now 42. Altogether 44 swarms have issued, of which four absconded and several small ones were united. As regards the honey yield, this was very promising in October and November, and large surplus was obtained from several of the stocks, but the continued and persistent increase in bees has used up the results of one of the best honey-flows we have had for years.

To show how difficult it is to keep stock pure the following may be stated:—There was not a black bee in the apiary, and most were full-bred Italians, and there are no Black bees within ¼ of a mile of the locality, and now, with the exception of the colonies headed by the original Italian Queens, there are none that can claim to be more than Black bees with a trace of Italian blood in them.

Extracts from Foreign Journals.

SWEET AND ALSIKE CLOVER.

MRS. L. HARRISON.

From the American Bee Journal.

BEEKEEPERS have for many years been experimenting with, and seeking after plants which will pay to raise for honey alone, but have never found one that was satisfactory. The clovers are the most popular honey-plants, and, excepting the sweet clover (*Melilotus alba*), are favorites with the farmers.

The presence of sweet clover is sufficient proof that there are beekeepers near by. It is classed among pernicious weeds in Illinois, but this is a mistake, as it dies root and branch the second year, and does not spread. This is proved by the fact, that where roads and lanes are so full of it, and its growth is so rank that it is difficult for a team to drive through, yet not one stalk will be seen growing in the adjoining fields. During muddy weather the seeds are carried on waggon wheels for long distances, and seem to germinate more readily in this way. I have an idea that the seed heats easily, for several times I have gathered it as it ripened and put it into a paper sack, and sowed it in waste places, and not a plant appeared. But when I cut off the stalks and scattered them, it grew and held its own ever afterwards.

When speaking of this plant, I always think of the old minister who had a surly wife and would not allow any of the fraternity to visit him. When one of his brethren was condoling him he said, "Don't pity me too much, brother; my wife has some good streaks." This plant also has its good points, growing and thriving in poor gravelly soils, and enriching them by its deep, long roots and branches, and preventing gullies by holding the soil; and lastly by producing the choicest nectar during droughts and periods of scarcity. It has value as a forage plant in early Spring, as it grows before other clovers and is relished at this season by stock, and especially by fowls. It is sometimes cut and stored with hay on account of its fragrance, as it will perfume the whole mow. Gather the stalks now, and cause the waste places to rejoice with the happy hum of industrious bees next year.

White and red clover have an established reputation, and need no words of praise. Alsike or Swedish clover (*Trifolium hybridum*) is a stronger grower than the white, and has a white blossom tinged with pink. It forms excellent pasture and hay, and some of the Indiana apiarists exhaust our language in its praise: it thrives with them on a damp, clay soil. I have tried to grow it in dry, sandy soil, and always failed, but have since learned that it is sown in Sweden in late winter upon the snow, and I never tried sowing it at this season.

EMPTY COMBS.

HOW TO FILL THEM WITH SYRUP OR HONEY, FOR FEEDING BEES.

C. C. MILLER MAKES IT SO PLAIN THAT EVEN A CHILD MAY UNDERSTAND IT.

From Gleanings in Bee Culture.

In *Gleanings* for June 1, 1886, page 463, you say that Dr. C. C. Miller, in his new book, says that, when he has a colony to be fed, he does it by filling empty combs with syrup, in a manner similar to that given by our old friend Quinby, years ago. Now, will you please tell me, either in a letter or through *Gleanings*, how they manage to get the syrup into the empty combs, and oblige? I have tried to do it, and failed. I suppose it is all easy enough when we know how.

N. L. GERRISH.

Nottingham Centre, N.H., Oct. 14, 1887.

Dr. Miller replies:—

If you lay an empty comb flat upon a table, and pour a liquid on it, instead of the liquid immediately running into the cells it will lie contentedly upon the surface. If the liquid fall from a considerable height, so as to strike hard upon the surface, some of it will force its way into the cells; so if you pour syrup upon the comb out of a pitcher, holding the pitcher 3 or 4 feet above the comb, you will succeed better than if the pitcher be held only a few inches above the comb. Even then, if a portion of the syrup falls in a compact mass upon an empty cell it can enter the cell only by displacing the air contained therein; and if the syrup presses with equal force over all parts of the mouth of the cell there is no chance for the air to get out, and the cell remains empty. In other words, if a drop larger in diameter than the cell falls centrally upon the cell, the chances are that it will simply act as a cork to cork up the air that is in the cell; but if the drop be so small that it strikes nowhere upon the sides of the cell, there is nothing to hinder it from going directly to the bottom of the cell; and if it strikes upon one side of the cell it will still make fair progress bottomward. So the smaller drops we can have as it falls, the better success we shall have; and to this end, instead of a pitcher we will take a watering-can from which to pour the syrup. But thick syrup will not readily pass through the rose of a watering-can, so we must have thin syrup; and as we desire syrup (at least in the fall) no thinner than can be made by using 5 lbs. of sugar to one quart of water, we must thin it by using it hot, taking care not to have it hotter than about 125°, as beyond this there is danger of making the combs so soft that they will give away. So now I think we have reached the essentials: We lay our comb flat upon the kitchen-table, and pour upon it from a height of several feet, through the rose of a watering-can syrup heated to 125°.

Whoever fulfils these conditions will, I think, make no failure in filling his combs. He will, however, not leave the table or the floor of the kitchen in the best condition; and any further effort needed is simply to prevent waste and muss, unless it be to make the work lighter. To this end, get a tin box made about two feet deep, about half an inch or an inch longer than the top-bar of your brood-frames, and about an inch wider than the outside depth of the frames. It will cost a little less to have made a wooden box of the above dimensions, without top or bottom, and then place it in a tin pan three or four inches deep, and large enough to contain the box. In either case, in one of the lower corners of the tin box (or of the pan) a hole should be made with a spout, say an inch in diameter and about three or four inches long, through which the waste syrup can pass to be caught in a pail or other vessel standing under the spout. Of course, the whole affair must be elevated sufficiently to admit of the pail standing under the spout; and the operator, if necessary, can stand on a box to make him high enough. Now take an old tin quart fruit-can, hold it upside down over a very hot stove or fire till the solder melts so the top can be easily knocked off. Then with a 2½ inch No. 12 wire nail, or a punch of the same size, punch holes in the bottom of the can. Punch the holes from the inside, so the projections shall be outside. Make a row of holes around the outer edge, about ⅜ of an inch apart; ⅜ of an inch inside of this another row, then inside of this again, filling up the bottom with holes about ⅜ of an inch apart. Near the upper edge, punch two holes on opposite sides, and into one of these holes pass a piece of wire about a foot long, fastening together the two ends by twisting, then serve the other hole the same way. Tie one end of a string into each of the wires, and tie the other ends of the strings into two nails or staples in the ceiling, five or six feet apart. Let the can be hung about three feet above the bottom of the tin box, and let the strings hang crosswise (not lengthwise) of the box. Put a comb in the bottom of the box, then pour a dipper of syrup rather rapidly into the can, and with the left hand keep moving the can so as to fill all parts of the comb; turn the comb over, fill the other side, raise the comb and let it drain a few seconds, then put it into a super, or hive without a bottom, to slowly drain off. It is, of course, well to have a pan, sufficiently large underneath to catch the drip, and the combs may be tiered up five or six high. If you don't want your clothes unnecessarily daubed when stooping to lift the frames, slip the can into the dipper and hold it out of the way. To prevent the holes in the can from becoming frequently clogged, put in the top of the can a little wirestrainer, such as are used for straining herbs.

Marengo, Ill.

C. C. MILLER.

BEGINNING IN BEEKEEPING.

L. C. ROOT.

From the American Bee Journal.

THOSE interested in our pursuit should spend some portion of their leisure during the winter months in acquiring information in regard to the most approved methods in the apiary. It is desirable that those who wish to commence beekeeping should become familiar, not only with the necessary, but the best fixtures, in order to begin intelligently, and to continue in the right direction.

Many beginners do not attach sufficient importance to this matter of preparation by reading, and often find it necessary to make many changes, thereby incurring much needless expense. Others become discouraged and drop the business in a year or two, when, if circumstances had been more favorable, they would have attained, with application, reasonable success. It is a mistake for beginners to hope to reach at once, results equal to those who have had years of experience. Those who indulge in this idea, will be sure to meet with disappointment. It is a common mistake with modern writers upon beekeeping to offer too glowing inducements to the inexperienced.

In my opinion there are, at the present day, two distinct classes, taking extreme ground in relation to our interests, both of which I conceive to be in error. One class endeavors to induce all, without regard to fitness, to engage in beekeeping, assuring them, by delusive statements, that it is the highway to prosperity. The other, on the other hand, says that the business should only be conducted by specialists, who devote themselves exclusively to it. I am often told that I am helping to instruct the public to produce such quantities of honey, that those of us, who make it a special business, cannot dispose of our own honey at figures that will make it remunerative. I admit that there may be some truth in this, if we are to be controlled by selfish aims alone, but I cannot believe that this is the proper view to take of it.

The facts are these: All over this beautiful land, blossoms are secreting honey which is passing away and being wasted, at the very doors of those who might, with a proper understanding of the means, secure it as a wholesome article of food. Again, there are those in nearly every community, who are keeping a few colonies of bees in box hives, and in the old way securing little or no profit. This is the class I desire more particularly to influence. One of the earliest lessons I received was, that whatever it paid to do at all, it paid to do well. If it pays at all to keep bees in the manner alluded to, it certainly must pay much better to keep them after the most improved methods of the present.

It is not true that all can keep bees successfully, but only such should undertake it as are by nature adapted to it, and will give it the

same thorough continued application that is required to make any branch of business profitable. If one desires to understand how to commence rightly, and to become familiar with what is required to conduct beekeeping satisfactorily, secure some practical work on the subject which does not represent either class of extremists just mentioned; begin moderately, and grow into the business as experience increases.

HINTS ABOUT HANDLING BEES—STINGS, ETC.

WM. MUTH-RASMUSSEN.

From the American Bee Journal.

THE bee is, as everybody knows, provided with a formidable weapon, formidable in proportion to its size and effect; but this weapon (the sting) is very seldom used, except as a means of defence. The honey-bee is naturally a peace-loving insect, and has no desire to molest anybody as long as it is left to pursue its industrious calling without interference.

While flitting from flower to flower, or sipping the water at the bank of a babbling brook, the bee has no more thought of warfare than the man who peacefully works to provide for his loved ones at home. But let an evil-disposed person try to injure this home or its occupants, or rob it of its hard-earned stores, and the man is immediately on the defence with the best means at his disposal.

Can you blame the bee, the most industrious and intelligent insect, for what you commend in man? Its sagacity and courage are to be admired rather than deplored. Without these qualities the bee and its precious stores would be a prey for numerous enemies, all too fond of insect-food and honey, and but little of the latter would fall to the share of him to whom the Creator gave "dominion over every living thing that moveth upon the earth."

It then devolves upon man to learn the nature and traits of the bees, and to so use this knowledge that he may reap the fruits of their industry without pain or danger to himself, and without unnecessary annoyance or harm to these humble servants.

The time of cruelly submitting a colony of bees to a horrible death over the brimstone-pit, for the purpose of obtaining a scant supply of honey, is past. As well might we kill the sheep to obtain its wool, or the goose for her feathers. By proper precautions there is no more danger in obtaining the honey than the wool and feathers. Certain rules must be observed, to be sure; but by means of these rules the beekeeper is as safe at his work as a workman in any other occupation.

AVERSION OF BEES.

Bees dislike all black, dark or iron-gray colors; fur, hair and wool are an abomination to them. The beekeeper should, therefore,

avoid clothing of such material and colors, when in the apiary. He should also keep his hair and beard covered; and as the eyes and nostrils present dark spots in the face, more liable to attack than the smooth skin, it is generally safest to keep the whole head protected by some kind of a bee-veil. This may be simply a sack of dark-blue mosquito-bar or tarlatan, or it may be a flour-sack with a piece of wire-cloth inserted in front of the face.

The best bee-hat is made by sewing a cylinder of wire-cloth to the rim of a straw or calico hat, and adding a broad strip of cloth to the bottom of the cylinder. The cloth falls over the shoulders, or may be tucked under the coat-collar. The hands should never be protected. Any kind of glove which may be worn will be more objectionable to the bees than the bare hands. If the bees are particularly irascible, singe the hair off the back of the hands and dip them frequently in cold water.

Quick motions and sudden jars to the hive should be avoided. Hives should, therefore, never be opened in cold weather, when the propolis, with which the cover and frames are fastened, is hard, and when everything comes apart with a snap. The breath of some persons is objectionable to the bees; but in hunting for a queen on the comb, I frequently blow hard on the bees to make them disperse and move around, and I find that such a blow of cool air is less objectionable and less irritating to them than smoke.

FRIGHT OF BEES.

Bees have a natural fear of smoke. Taking advantage of this trait, smoke is the principal weapon in the hands of man with which to control, subdue or direct the bees. By judicious use of smoke the bees may be made to move in any direction desired, as they will always retreat from it.

A roll of cotton rags of the size and shape of bologna sausage makes a very good smoker. The rags should be rolled as hard as possible to prevent blazing, and tied every two inches. The bellows-smoker, now so commonly used by beekeepers, is, however, a far superior implement, as it will burn anything that will burn in a stove, and avoids danger of fire, which is often caused by the cotton roll.

MANIPULATING COMBS.

In the manipulation of combs great care should be used not to pinch or crush any bees, as the odor of poison extruded by such is exceedingly irritating to the other bees in the hive, or to those flying about. If a bee is crushed or stings the hand, a few puffs of smoke on the spot will generally neutralise and conceal the odor of the poison.

When it is necessary to remove the bees from a comb, the best way is to shake them off, holding the frame so securely that it will not slip out of the fingers. As, however, some bees will hold on with the tenacity of a

kitten, they must be brushed off. For this purpose nothing is better than a single, large eagle feather. This should be frequently dipped in water to keep it soft and pliable. A wing or brush is not desirable, as the bees may get entangled in the feathers, hair or fibres, which is very exasperating to them.

If a comb contains queen-cells, which it is desirable to save, such a comb must, however, not be shaken, as the sudden motion is liable to injure the embryo queen. The bees must then all be brushed off, and to dampen their possible ire at this proceeding, it is advisable to sprinkle them slightly, and frequently dip the feather in water. This prevents them from taking wing immediately, and getting the impression that a shower is coming up, they are more desirous of taking care of themselves than of attacking their owner.

A FULL COLONY OF B'S.

S. M'LEES.

From the American Bee Journal.

As I have noticed the "Swarm of Be's" on page 438, and do not think it more than a nucleus, I send to the *American Bee Journal* what I consider a "full colony," selected from my old scrap-book.

[The "full colony" referred to in the above, is as follows:—Ed.]

B-think ere you stumble, for what may B-fall,
 B-truthful to self, and B-faithful to all;
 B-watchful, B-ready, B-open, B-frank,
 B-manly to all men, what e'er B their rank.
 B-calm, B-retiring, B-ne'er led astray,
 B-grateful, B-cautious of those who B-tray.
 B-careful, but yet B-sure to B-stow;
 B-temperate, B-steadfast, to anger B-slow.
 B-earnest, B-truthful, B-firm and B-fair,
 B-meek, and of all miss-B-haviour B-ware.
 B-pleasant, B-patient, B-servent to all,
 B-best if you can; but B-humble withal.
 B-just and B-generous, B-honest, B-wise,
 B-mindful of time, and B-certain it flies,
 B-hopeful, B-cheerful, B-happy, B-kind,
 B-busy of body, B-modest of mind.
 B-brave, and B-ware of the sins that B-set,
 B-sure that no sin shall another B-get.
 B-prudent, B-liberal; of order B-fond,
 B-ay less than you need, B-fore buying B-yond.
 B-prompt and B-dutiful, still B-polite,
 B-reverent, B-quiet, B-sure and B-right,
 B-thoughtful, B-thankful, what e'er may B-tide;
 B-trustful, B-joyful, B-cleanly B-side,
 B-tender, B-loving, B-good and B-mign,
 B-loved shalt thou B, and all else B-thine.

BEEKEEPING WITH OTHER PURSUITS.

DR. C. C. MILLER.

From the American Bee Journal.

SHOULD beekeeping be made an exclusive business, or should it be pursued in conjunction with some other business? This question can be best answered after considering some of the pursuits that may be combined with

beekeeping. I am competent to speak of only a few; and if it seems really desirable that there shall be a combination, perhaps others may be called out. Perhaps I may arouse Mr. G. M. Doolittle by saying that I think he has made one of the worst combinations possible in combining beekeeping with small fruit raising. I think there is a somewhat general impression that beekeeping and raising small fruits go nicely together. There is this much to say in favor of it—that the man with the right taste for beekeeping is apt to have the right taste for a fruit raiser; and if successful at either he would be successful at the other if he should turn his attention to it.

But a business to be combined with beekeeping should be one that would require the attention of the beekeeper mainly at a time when his bees require no care. So far as my experience goes, the small fruit business requires the closest attention at the very time the bees demand it. As soon as spring has fairly opened, there is work to be done at the bees, and so there is at strawberries, raspberries, etc. As the season advances, the bees become more imperative in their demands, and so do the berries. In the height of the picking season, when the eyes of the fruit raiser must be everywhere to see that pickers are making good work, to settle disputes, to make sure that berries are promptly sent to their proper destination, and not allowed to lie over and spoil—at this time, when the fruit raiser, unless possessed of a very cool head, is about half crazy, the bees alone are enough to make him go distracted when a dozen swarms may come out at a time. In a word, the busy time for each comes at the same time; and what is wanted is something to occupy the *leisure* time of the beekeeper.

Teaching school, I think, comes nearer to it; for the busy time with bees comes in the Summer vacation; and one with sufficient strength and the right taste might take care of quite a number of colonies without interfering with school duties. I think, however, he would in time decide as I did, to give up one or the other. A notable exception, however, is in the case of Mr. E. A. Gastman, of Decatur, Ills., who has been for many years superintendent of schools, if I am not mistaken, and at the same time a beekeeper. Mr. Gastman, however, is a man of magnificent physique—by the way, it just occurs to me that he is very much the build of G. M. Doolittle—and looks as if he might easily do the work of two ordinary men.

Of course, there may be many special departments in which different individuals may have developed special taste and ability, where a somewhat successful combination might be made. For instance, the teacher of the old-fashioned singing-school (now unfortunately out of vogue) could take care of bees without interfering with his "schools," held only on the long evenings.

But what we are after is something that may be done by almost any one with the requisite qualifications to be a good beekeeper. I think I have heard poultry-keeping spoken of in connection with beekeeping. That, again, comes too much like berry raising. When work begins to press with the bees, old Biddy will be wanting to sit, and perhaps two or three hens will be sitting on one nest, persistently changing from where you want them, till you feel like shutting your teeth together hard, and saying, "What does make you act so, when I haven't time to fuss with you? I should just like to ring your necks for you." Yet after all this is said, there remains the fact that, in at least two instances, periodicals have been published having for their specialties beekeeping and poultry raising. Why this, unless the two pursuits were supposed to have some special adaptation to each other?

To tell the truth, if a young man to day were to write me, "I have at least ordinary ability as a beekeeper, and have decided that I must have some other pursuit to connect with beekeeping, what shall it be?" with my present knowledge I should reply, "Keep poultry." But I would not have any hens sitting in swarming time, nor, indeed with flocks of little chicks wandering about, trying to lose themselves in the wet grass. I have studied some little about it, and taken some observations; and I think the whole business of poultry raising might be done almost entirely when bees require little attention.

Mind you, I do not say it is best to combine at all; but if combining is done, the merits of poultry keeping deserve consideration.

DO BEES INJURE FRUIT?

This question was the subject of a series of experiments recently made by Professor N. M. McLain, of Canada, and the result must be interesting to both fruit-growers and beekeepers. The experiments were made for the purpose of testing the capacity of bees, under exceptional circumstances, to injure fruit. The Professor confined two colonies of Italian bees, two of Hybrids, one of Circassians, and two of Syrians, in a house specially constructed for the purpose, and by the temperature maintained and other expedients, all the conditions were obtained of an unusually severe and protracted drought. The bees were repeatedly reduced to the stages of hunger, thirst and starvation for a period of 40 days, but every opportunity was afforded the bees to appease their hunger and thirst by attacking the fruit placed before them. Some of the bunches of grapes were dipped in syrup, and hung in the hives between the comb, some placed before the hives on plates, and grapes were suspended in clusters from the posts and rafters. The bees lapped and

sucked all the syrup from the skins, leaving the berries smooth. They sucked all the exuding juice of the grapes, but made no attempt to penetrate the skins. He found that not only were the bees unable to penetrate the epidermis of the grape, but they appeared to be incapable, even when impelled by the direst necessity, to penetrate the film surrounding the berry after the skin had been removed. Clusters of sound grapes, which I hung between the comb frames in hives occupied by strong colonies were unbroken and sound after fifteen days' exposure in the hives. The skins were polished smooth, but none were broken. Where bees are found on the ripe grapes, they are not "tearing the grape" as some vignerons suppose, but are simply gleaming the juice which is exuding through violence, over-ripeness, or decay. The result of the investigations, then, may be said to be a complete vindication of bees from the charge brought against them of being destructive to ripe fruit. On the other hand, there can be no doubt of their value to orchardists as a means of fertilising fruit blossoms, and it was on this ground that some time ago a protest was entered against the introduction into this colony of the moth-eating plant (*physianthus albens*). The fear was expressed that the plant would capture bees as well as moths, but so far there does not seem to be any sufficient ground for this apprehension.—*Victorian Farmers' Gazette*.

QUIETING BEES WITH A CARBOLISED SHEET.

MANY British beekeepers adopt the plan of quieting or *frightening* bees with Carbolic Acid instead of smoke, and appear to work successfully and comfortably with it. The Rev. G. Raynor thus describes the plan in the *British Bee Journal*. The Solution used is made as follows:—

Calverts No. 5 Carbolic Acid	...	1½ oz.
Glycerine	...	1½ oz.
Warm Water	...	1 qt.

The Acid and Glycerine to be well mixed before adding the water, and the bottle to be well shaken before using. A piece of calico, or preferably cheese-cloth, sufficiently large to cover the top of the hive, should be steeped in this solution, wrung out dry, and spread over the hive on removal of the quilt, when every bee will quickly disappear below, and manipulation may be slowly and quietly performed without annoyance from the bees. The same plan is effectual in driving the bees out of section-cases. From unsealed sections they often refuse to budge, but a little blowing through the strainer will always dislodge them. All our sections are thus removed, and we have never experienced the slightest scent or flavor of the carbolic acid attaching to the

comb or honey. This unpleasant result occurs only to bunglers, who either use too strong a solution, or do not wring out the carbolised sheet sufficiently dry, and so besprinkle the comb honey with the solution, and charge the evil result of their own stupidity on those who recommend the process. The strength of the solution quickly passes away, as the acid evaporates when exposed to the air.

THE ANNUAL HONEY PRODUCT of North America is about one hundred millions of pounds, and its value is nearly \$15,000,000. The annual wax product is about half of a million pounds, and its value is more than \$100,000. There are about 300,000 persons keeping bees in North America. We make this estimate in response to many requests for the most accurate statistics obtainable.

BORAGE—This is a great favorite with bees and yields both pollen and honey in abundance, grows well in most soils, is hardy, and blossoms nearly all the year round if sown in succession. It requires but little care in cultivation but does best with plenty of room and rich ground and grows well where thistles thrive.

A SMALL SWARM OF BEES—On the 2nd of January a very small swarm of Bees was found on a pear tree, it was so small that the bees were counted, there were 138, three of which were Queens. These were Italian bees.

A MOUSE IN A BEE-HIVE.—While packing hives up for the winter at Shipley Glen, Saltaire, I came across the skeleton of a mouse in a straw hive. The creature had managed to creep in, but it had no sooner entered than Mousy was stung to death, and the bees, unable to carry off the carcass, carefully removed and conveyed outside the hair, the skin, and flesh, leaving the skeleton neatly picked. The parts of the mouse they could not reach were neatly sealed with wax from the air, and there was not the least particle of smell in the remains of the little quadruped.

—WM. DIXON, Belmont House, Beckett Street, Leeds, October 4th.

A TRUCK LOAD OF BEES—About a month since an apiculturist sent off from Melbourne about 50 hives of bees by rail to our N.W. district. Every hive was well and safely packed, but from careless handling while transferring at the branch station, a lot got damaged. Arrived at their destination, the porters opened the doors prior to unloading, but made a rapid stampede paving their heads and faces like bears in a bee garden. The bees had got out of the hives in swarms. Some courageous navvies were got to close the truck doors and shunt the truck down the line about half-a-mile. The consignee was com-

municated with and requested to remove his goods without delay! He did so and had a most exciting time of it.

ECHIU M CANDICANS, OR VIPERS BUGLOSS.—This plant is a wonderful bee plant in these colonies, furnishing an early and moderately lasting supply of nectar. The plant flourishes well, even in poor soil and in dry places, and does well when grown in a shrubbery among other trees. It does best, however, in a moderately stiff soil, and if the soil be rich, it yields the more flowers and honey. Seeds sown in October or November, should be planted out in March or April, giving plenty of room (4 or 5 feet square to each plant). Some will, perhaps, flower the following summer; but the majority will not do so till the second year. The honey from *echium* is not to be surpassed, and a good plot of this plant would pay the beekeeper well, for, once established, the plant will last several years. The *echium* is allied to *Borage*, *Cerinthe*, and others of the *bugloss* tribe.

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VOL. II.—No. 9.]

FEBRUARY 19, 1888.

[PRICE 6D.

NEW BEE BOOK.

A REALLY scientific treatise on "bees and bee-keeping" has been in course of publication for the last two years. It is from the pen of the well-known writer and apiculturist, Mr. FRANK R. CHESHIRE, F.L.S., F.R.M.S., and has been issued in numbers, the first 12 of which form a volume or Part I., *scientific*. The 2nd part, being the *practical* section, has just now reached us, and, although from what we know of Mr. Cheshire, and what we have seen of his writings, we expected great things of this book, we have had our expectations more than realised. Part I is a most useful, exhaustive, and scientific treatise on the anatomy and physiology of the hive bee, and Part 2 deals with its profitable management. In the second part, which contains 11 chapters, the following subjects are most interestingly and carefully treated, viz.:—Bees under proper control; Hives; Hives for beekeepers; Natural increase; Artificial aids to cell building; Controlled increase; Queen rearing; Management of apiary; Production of honey; Wintering, &c. This is not in the ordinary sense a bee manual, it does not tell the beginner the way to do everything; but it deals with the principles and science of bee management in all its branches, as put in practice by well-known apiculturists; discusses various methods, and puts before the reader, in a clear and pleasant manner, the ways by which successful management in every branch of the art may be achieved. We have never read a bee book with more pleasure and profit than Mr. F. Cheshire's *Bees and Beekeeping*, and we intend referring to, and extracting from it with regard to various matters that may come under discussion in these pages.

HINTS FOR MARCH.

It is not at all unusual, if the weather be favorable, to have a good honey-flow during

March, and even in the early part of April, in many districts where eucalypti abound. Indeed, in most seasons and in all best localities really scarce in bee forage, there is generally a honey-flow of more or less abundance after the middle of February till beginning of March, unless the Autumn be wet and cold. In some of our mountain localities, indeed, this period often produces the chief and best honey-flow of the year.

Some little management is necessary where beekeepers are working for comb-honey in sections to avoid too many partially-filled boxes. Such boxes as get sealed in the centre of the racks or crates should be removed at once, and those next them closed in without adding new boxes on the outside unless the honey-flow is a really good one. As soon as the Autumn gathering falls off remove all the partly finished sections and extract the honey, put them back in the hive for the bees to clean out, and then take them out and put them away in a dry place where neither mice, moths or ants can get at them, for they will be invaluable for starting bees in the supers in Spring. Bees will often go into a super directly they are put on, if they have clean combs ready to start, or better, clean combs with a little good honey in one or two of them, while with boxes with foundation only they will often refuse to commence for weeks, or, perhaps at all.

A careful look-out should be kept this month for any appearance of foul brood, for it is the latest time we can move the bees into a new hive with any hope of their building enough comb to winter on. Any operation of this kind should be done early in the month while there is still a chance of honey coming on. In any case, liberal feeding must be kept up to enable the bees to well establish their combs before cold weather comes on.

Extracting should now be done pretty closely as honey quickly thickens and gets viscid and difficult to throw out at this season.

Preparations for wintering are desirable even in our mild climate. By the end of March or beginning of April, all those stocks that have not enough stores to carry them well through must be fed, and stocks very short of provisions should be fed at once; from 10 to 20-lbs of stores, according to the size of the colony, will generally be found sufficient, as some little food is gathered throughout the winter, except in our bleakest localities. Where stocks are found too light by the beginning of April, arrangements should be made to enable the bees to stow away from 15 to 20-lbs. of honey from healthy hives, or of thick syrup made with $2\frac{1}{2}$ to 3-lbs. of white sugar to every pint of water.* Give it in feeders from which the bees can take as rapidly as possible—feeding in dribbles at the end of Autumn is injurious.

March is the month for much sowing and planting for bee forage. Clover, both white and alsike, should be sown in March or April while the ground is still warm. Borage, sunflower, cornflower, and, indeed, almost every useful bee plant might be sown now, and, such as require it, transplanted in the early Spring. Early forage can be secured in this way.

Those who have room in their ground and do a little planting for their bees should get a few plants of the red, pink and white flowering gums—*Eucalyptus ficifolia* and *E. calophylla*. They will commence flowering in a year or two, and not only yield abundance of honey and a great delight to the bees, but pretty trees with abundance of beautiful flowers as well.

THE HONEY MARKET.

Comb-honey in sections, or bell glasses, is in great demand, and commands good prices, from tenpence to fifteenpence a pound, wholesale. Run, or extracted honey in bulk, is still a drug; but good, clear extracted, in tasteful packages, nicely got up would, we believe, soon command a market at remunerative prices. Grocers sell the roughest and least tempting parcels, chiefly in pickle bottles, with brown paper pasted over, readily at 8d. to 1s. per pound. While in bulk, wholesale, it does not command 3d. per pound. Picked comb-honey from box-hives, is hawked, and sold freely at from 1s. 3d. to 1s. 6d. per pound. As a rule, good comb-honey has been scarce in the Melbourne market this season so far. It is time beekeepers took a lesson from our American friends, in putting up this extracted honey for the market; indeed, we need only go to Adelaide to learn a lesson in this respect, where selected extracted honey is done up in pretty and tasteful glass packages and meets with ready sale at remunerative prices. Large quantities of coarse and unsaleable kinds are

now being used for the making of hop beer and such like beverages in some parts of the colony, for which it is certainly better than sugar, and generally imparts a very pleasant flavor to the beverage.

We are sorry to find that coarse, thick, bush honey is being thinned down by addition of water to such an extent as to bring about fermentation, and we have seen several bottles of this kind within the last week or two which have been bought in the suburbs of Melbourne at a shilling for a pickle bottle full that had become partially acid from the formation of vinegar.

FOUL BROOD IN SOUTH AUSTRALIA.

NEXT to bad seasons the greatest difficulty beekeepers have to contend with in Australia is, undoubtedly, *foul brood*, and every year it seems to get a stronger hold. It is no wonder, therefore, that our South Australian friends—who are not only the most advanced in the industry, but really have a larger amount of capital invested in it, we believe, than any other colony—have taken alarm, and a large section of them moved parliament to legislation, with the view of arresting the spread of the pestilence, which already threatens to reduce apiculture to a difficult and profitless undertaking. We have already spoken of the action taken in getting the "*Foul Brood Prevention Bill*" passed into law, and of the opposition it had engendered, especially among box-hive beekeepers. From our correspondent in South Australia, we have received a pamphlet issued by the South Australian Beekeepers' Association, on *Foul Brood and its Treatment*, as well as some extracts on the same subject. The leaflet from the Association on *foul brood* is as follows:—

SOUTH AUSTRALIAN BEEKEEPERS' ASSOCIATION.

PRACTICAL INSTRUCTION FOR BEEKEEPERS.

LEAFLET NO. 1.

FOUL BROOD.

FOUL BROOD is an infectious germ disease affecting the brood, caused by a minute organism termed *Bacillus Alvei*. It is the most serious difficulty in the way of successful beekeeping in South Australia, and, unless stamped out when discovered in an apiary, will certainly spread from hive to hive.

It exists in all parts of the colony where bees are kept and beekeepers must be prepared to cope with it.

In a hive affected with this scourge the caps of the sealed brood appear indented, and sometimes pierced or partly removed, and the cells contain a putrid, sticky, coffee-colored substance (all that remains of the larva), emitting, in bad cases, a most disagreeable stench.

*A tablespoonful of good vinegar, or $\frac{1}{2}$ -oz. tartaric acid to each 8-lbs. of sugar while boiling, prevents crystallization.

When this disease attacks a colony, it rapidly dwindles because of its failure to rear brood; as it becomes weak, other colonies rob it, and thus spread the disease.

When this disease is discovered, *immediate* steps should be taken to eradicate it; it is so infectious that all materials used in connection with a diseased colony—whether frame, box, honey, pollen, or propolis—will easily communicate the disease if other bees have access to any of them.

Directly the presence of *foul brood* is suspected, examine carefully all the hives in the apiary, and mark those that have the disease or are suspected, and at once make preparations for curing them.

METHOD OF CURE.

There are several ways of eradicating *foul brood*, but that which has been found the most certain by South Australian Beekeepers is Muth's method. It is as follows:—Transfer the bees from the infected hive to a clean or new hive containing frames with foundation, and feed them with honey or sugar syrup medicated with Salicylic Acid. The combs from the infected hive are to be burnt, and the hive and frames thoroughly disinfected as described further on. If this method is honestly carried out, *foul brood* will certainly be eradicated every time, and the bees, having got clear of disease, will soon make up for the loss of combs and brood.

THE OPERATION.

Everything should be prepared beforehand. Get ready as many hives or boxes as there are diseased colonies of bees. If you have frame hives, prepare frames for the clean hives, with strips of foundation half-an-inch wide fixed to the top bar: five or six frames to each hive will be sufficient, unless the colonies are very large. Now go to a diseased colony, blow some smoke in at the entrance, open the hive, find and cage the queen, and place her thus caged in the new hive. If you cannot readily find the queen, omit this, but caging her prevents the bees swarming out. The best plan is to suspend the cage between two of the top bars of the centre frames by a piece of wire or strip of tin. Leave the queen caged for at least 24 hours before releasing her.

Remove the old infected hive from its stand, and place the clean hive in its place. Arrange a board sloping from the ground to the entrance of the new hive, so that the bees can crawl up. Now, one by one, take the combs from the diseased hive and shake or brush the bees off them on to the ground in front of the new hive. In the case of a box hive the bees must be smoked and drummed out in the usual way into a clean box. It is safer to burn the old box.

Replace the diseased combs in the old hive and close it carefully—so that no bees can get in—and carry it to a room where it can remain unmolested till wanted for further treatment.

The bees in the new hive should be fed with

medicated food, prepared as follows:—Make a solution of Salicylic Acid in the proportion of 16 grains of the acid and 16 grains of Soda Borax to one ounce of water, and add one ounce of this solution to every quart of food. The best food is honey, diluted with one-fourth of its quantity of water; but if no honey is on hand, make a syrup of sugar and water, using one pound of sugar to one half-pint of water. The food, whether of honey or sugar, should be heated until it boils, and the acid solution then added. The food may be given to the bees in any convenient way; perhaps the simplest plan is to make a feeder out of an empty mustard or other similar tin having a movable lid, by punching a few holes in the lid with a fine bradawl. This feeder is to be filled with the medicated syrup and turned over with the holes down on the top of the frames, so that the bees can sip the food through the holes. Feeding, in every case, should be done inside the hive, and after sundown. About one half-pint of medicated food should be given to each colony every evening for one week.

To return to the hives containing the diseased combs. All comb containing brood should be carefully cut out and destroyed by fire, or it may be buried in the ground, providing there is no possibility of its being disturbed. All honey should be extracted from the combs, either with an Extractor, or by putting the honey combs in a tin vessel, and heating it gently until the wax is separated, and floats on the top of the honey. When cool, the wax can be removed in a cake. The honey should then have one-fourth of its quantity of water added to it, and be boiled for ten minutes, in order to destroy the germs of disease. When the Salicylic Acid has been added as before described, this honey will afford safe feed for the bees. If the honey is removed by the Extractor, the comb should afterwards be cut from the frames and melted into wax.

The hives and frames should be well scraped, and the scrapings allowed to drop on a newspaper, so that they can be readily burnt.

To clean and disinfect the hive and frames, dip them into or scrub them with boiling water and Carbolic Soap.

After handling a diseased hive of bees it is important to thoroughly disinfect the hands and implements that have been used in the work. For this purpose some of the Salicylic Acid solution may be added to a basin of water and applied with a sponge. But as this is not pleasant for the skin, a better plan is to use a solution of Carbolic Acid, made by adding one part of Calvert's Carbolic Acid to 200 parts of water.

After treating an infected hive, the stand and ground where the hive stood should be sprinkled with Carbolic Acid to destroy any germs that may there exist. For this purpose, an ounce of No. 5 Acid added to one gallon of water should be applied with a watering-pot.

Beekeepers are recommended, as a further precaution, to close the entrance of all clean hives with a piece of perforated zinc on the evening previous to the day on which the operation of transferring the bees is to be performed. If this is done, it is well to get through the work in the early morning, and release all the bees as soon as the operation is over.

The importance of thoroughly disinfecting every article used in the above operation cannot be over-estimated.

As indicating the opposition being shown to the "*Foul Brood Prevention Bill*" by certain classes of beekeepers in South Australia, we give the following extracts from the *South Australian Register*, being a report of a deputation to the Commissioner of Lands on 27th January, to protest against the operation of the Bill.

THE FOUL BROOD IN BEES ACT.

A PROTEST.

A numerous deputation of beekeepers from country districts waited upon the Commissioner of Crown Lands and Acting Chief Secretary (Hon. Jenkin Coles) on Friday, 27th January, with a petition to be presented to His Excellency the Governor, praying that the operation of the *Foul Brood in Bees Act* of last session should be postponed for twelve months.

Mr. BASEDOW, M.P., briefly introduced the deputation, which, he said, represented the beekeepers in all parts of the colony. The *Foul Brood in Bees Act* had been a cause of great dissatisfaction. The Bill had been passed rather hurriedly, and there was not sufficient time for the parties interested to express their opinion in time to prevent its being passed.

Mr. WARREN (Williamstown) said that the petition had been signed by 884 persons, 588 of whom were beekeepers, who held 6,787 hives. Many of the memorialists depended in a great measure on the production of honey and wax for their livelihood, and the Act would inflict great hardship and loss on them. The petition included the following statements:—"That it will be impossible to keep bees under the Act in the common boxes; that the lowest quotation for the new style of box is 10s., and, as the Inspector will have power to order the transference of the whole of a man's bees into new boxes on a week's notice if he chooses to think there is *foul brood* in them, together with the total destruction of the honey, wax, &c., in the hive, it will be necessary to keep a double set of boxes on hand, thus doubling the cost. The necessary appliances, &c., will on the average cost about 5s. per hive more, so the total cost will be about 25s. per hive of bees kept, a sum quite beyond the means of many of the memorialists, who will either have to go to this

expense or destroy their bees. That the framers of the Act admit that there is much doubt and obscurity about what they call *foul brood*, and the memorialists believe that if such a disease exists here the danger from it has been grossly exaggerated. That the Act passed through Parliament so hurriedly that no adequate time was given your memorialists to oppose it after its provisions became known, and that a memorial was got up hurriedly, for which 156 signatures, representing 2,742 beehives, were obtained in two days in a thinly settled district. Had more time been available three or four times these numbers could have been got, as only two refused to sign, and that an overwhelming majority of the beekeepers in the colony are strongly opposed to the measure, and, had enough time been given your memorialists, the opposition to the Act would have been so strong that the Bill would not have passed. That, supposing there is such a disease as *foul brood* in the colony, the Act is altogether of too crude a nature. Properly qualified Inspectors will be difficult to obtain, and no adequate provision is made for the destruction of bees having disease in the trees; and, if the disease is as contagious and infectious as some allege, it will be useless destroying the contents of the boxes if the bees in the trees around are diseased. That many of the memorialists believe it would be a mistake to destroy the bees in trees, as depleted hives are often replenished with swarms from them." The memorial asked that the operation of the Act should be postponed for twelve months to allow time for its repeal or amendment. The Act was passed in the Assembly in three consecutive sittings, so that no time was allowed for those interested to learn its provisions and oppose it. It was idle to say that the reports of the beekeepers' meetings at Adelaide and Mount Barker were notice enough. It appeared that there was no one in the House who had any practical knowledge of beekeeping, and no one therefore could speak on the subject or oppose the Bill with authority. The memorial thus contradicted in the most direct manner the statement that the beekeepers of the colony wished for the Act. Six thousand seven hundred and eighty-seven hives under the old box system would yield in a good honey season an average of 80-lb. honey, worth 3d. per lb. = £6,787; and, with very good management, one-half more, or £10,180, and 4-lb. of wax at 9d. per lb., £1,018; total, £11,198. Under the Langstroth system the yield of honey would be about 200-lb. per hive; value, £16,967; wax, 1-lb. per hive, £254; total, £17,221. This showed the importance of the industry, and as no especial effort was made to collect signatures, those attached to the memorial did not represent one-half of the hives in the colony. The output of honey could be trebled, as there were many most

suitable places in the colony where bees were not kept, or if kept, very little attention was paid to them. The mode adopted for obtaining signatures was this:—A number of memorials were printed and sent haphazard to persons through the country, mostly to stockkeepers. Many did not trouble themselves about the matter, and others took it up energetically. Had a system of canvassing been adopted, the signatures of nine-tenths of the beekeepers of the colony could have been obtained. He (Mr. Warren) came there as representing the Beekeepers' Association at Williamstown, and he knew that beekeepers generally would as soon destroy their bees as have them overhauled by an Inspector. It would be a most difficult matter to find out what *foul brood* really was, for an English specialist had affirmed that there might be 10,000,000 in one egg. Beekeepers might well object to having their hives inspected under the Act, as Government Inspectors were not always very civil, and no decision had been come to as to the nature of *foul brood*. From a statement in an English paper it would seem that *foul brood* had been repeatedly introduced into England by Ligurian bees. It was only lately that *foul brood* had been heard of in this colony, and possibly it had been brought here in the same way. To transfer bees within one week from one set of hives to another was an impossibility. The beekeepers whom he represented had the impression that the Act had been promoted by certain interested parties, who had the new bar-framed hives to sell, and who wished to get a good market for them. The idea had also got abroad that the Adelaide Beekeepers' Association were going to recommend the Inspector to the Government, and that the large beekeepers wished to crush out the industry among the poorer people.

Mr. OASTLER (Yankalilla) spoke in support of the memorial.

Mr. PEAKE (Rowland's Flat) said he had been a beekeeper for over fifty years, and had always found hives more or less subject to what was known as *foul brood*. There was nothing at all new in it, and it arose from different causes. The queen bee, when impregnated, went through the hive and laid perhaps from 3,000 to 4,000 eggs, and sometimes two eggs were in one cell. The nursing bees followed the queen, and took care of the eggs, giving them a sort of nourishment very frequently. If there were two eggs in one cell they would be neutral, and *foul brood* would result. In the case of an abortive egg the bees themselves would close up the cell with hard pollen, and prevent it degenerating into *foul brood*; but if the same egg had come to a larva or maggot then it would decay and stink, and thereby cause *foul brood*. When a great number of these larvae were in the combs and very cold weather came on sometimes the bees could not keep

the hives sufficiently warm, and that would cause *foul brood*. The sudden changes which marked our climate had a great deal to do with the existence of the pest. If an egg should be laid in the cell where the chrysalis of a former bee had been *foul brood* would result, because the egg could not come to maturity. Another cause was want of food by the bees. However, he had found *foul brood* in beehives in England as well as here, and he would advise the Government that the bees understood their own business much better than the South Australian Parliament could understand it for them. (Laughter). He had great experience in beekeeping, and in the old country he acquired a lot of knowledge about them from gentlemen at the Cambridge University, whom he used to supply with bees to keep for pleasure. It would be just as expedient to pass a measure prohibiting a farmer from having bad eggs from poultry as to attempt to suppress *foul brood*. (Hear, hear.)

Mr. MESSNER (Williamstown), who had kept bees for eleven years and now had 105 swarms, did not think any one could speak with certainty as to the cause of *foul brood*. He had noticed that the pest showed itself in bad seasons, and that it appeared at different places at the same time. He did not regard it as contagious, and he did not believe it could be eradicated. Most of the beekeepers still used the old boxes. The Inspector could not examine the hives unless he tore out the combs, and the bees would then fly away.

Mr. BERRETT (Barossa), had kept bees for twenty years, and was convinced that not more than one-twentieth of the swarms in the colony at present were entirely free from *foul brood*. He had for years past made not less than an average of £1 per week out of bees with very little trouble, and he thought the Government should prefer to listen to those who owed much to the bees than to be guided by people who kept bees for amusement's sake. In two or three months' time *foul brood* would not be visible, but now even the ants were affected in the same way as the bees owing to their being poverty-stricken. Last year the Inspector might have destroyed every swarm in the colony. If the honey and comb were taken away the bees would certainly die, because it was death to them to disturb them. He had lost more bees by heat than by *foul brood*.

Mr. MARTIN (Hahndorf) attributed the pest entirely to want of food for the bees. In a good season like that of 1886 there were no signs of *foul brood*.

The COMMISSIONER, in reply, said—This is a petition to His Excellency, and of course it will be presented to him in due course, and it will be for him, with the advice of his Ministers, to take such action as he may consider desirable. So far as *foul brood* in bees is concerned, I admit that personally I know nothing at all about it; and I have learned

more in reference to it to-day than I ever had the opportunity of previously learning. For one thing, I have learned that there is a very great difference of opinion among the gentlemen present as to the existence of *foul brood* in the colony, and consequently as to the cause of *foul brood*. One would imagine from the remarks made that the Government of day were responsible for the introduction of this measure. The Bill was introduced by a private member (Dr. Cockburn) at the instigation of the Beekeepers' Association, who held several meetings in Adelaide on the subject. I think the proper time for you to have raised your objection was when these meetings were being held, and when it was contemplated that the Legislature should be asked to pass this measure. They had nothing at all to do with it. You are a little in error in saying that the Bill was passed hurriedly. Every reasonable time was given for any opposition that might be offered to it. I think the principal opposition came from the beekeepers in the neighborhood of Williamstown. Their petition was considered, but the evidence brought before members as to the desirableness of this measure was considered so overwhelming that although the majority of the members had no practical knowledge of beekeeping, they felt compelled to vote for the Bill. It was with a view of protecting the bee industry of the colony that this measure was introduced and passed. Of course, if the Parliament had thought the Bill would have had an injurious effect on the bee industry of the colony they and the Ministry would not have supported it. If any blame was attributable to any one it must be to those who were the means of introducing the Bill. The memorialists ask the Governor to postpone the operation of the Act for twelve months, and you ask me to advise him to adopt that course. With every desire to meet your views as far as I can possibly do, you must admit that the step you propose would be a very serious one for the Governor to take. The Act was passed by both Houses, and the Parliament and country expect that effect will be given to the legislation of the session, unless there are very grave reasons to the contrary. However, I promise you that the statements made by Mr. Warren will be laid before my colleagues on their return from Sydney—nothing will be done in the meantime—and the decision of His Excellency will be communicated to you at the earliest possible moment. I am a little afraid that some of those who object to the Act have perhaps scarcely studied it. The bogey seems to be the Inspector. Most people agree that *foul brood* is a bad thing that should be got rid of, and all that the Act gives the Inspector power to do is this, that if he finds a person has in his possession or care a hive or swarm affected with *foul brood* to see that the person shall destroy them. Without expressing any

opinion as to whether the Act will be postponed or not, I may say that no person may be appointed by the Government as Inspector unless the Government are convinced that he would have no other aim than that of fulfilling his duty, and that he had a full knowledge of the work with which he is entrusted. The objection taken to the Inspector is simply like fighting a shadow. I will lay your petition before my colleagues.

The deputation thanked Mr. Coles and withdrew.

Proceedings of Beekeepers' Associations.

SOUTH AUSTRALIAN BEEKEEPERS' ASSOCIATION.

The monthly meeting of the members of this Association was held at Esselbach's Coffee Rooms on Thursday, January 5; Mr. C. Dickins in the chair. The members were unable to meet in the Chamber of Manufactures, in consequence of the attendant being absent with the key.

After some formal business had been transacted, Mr. H. H. Dollman read the following paper:—

"I first commenced the importation of Ligurian Queens from Italy three seasons ago, and during this time have received 110, but only 54 were alive on arrival, and this year the average has been lower than usual, for out of 50 imported 21 only arrived in good order. This great mortality was principally owing to the ravages of the bee-moth in the two first shipments of the season. The eggs of the moth had evidently been laid in the combs before the boxes were packed, and had hatched on the voyage, possibly through the heat of vessel. The Italian moths and grubs are very much larger than those here, and if there are any signs of them when the packages are opened, I take care to promptly destroy all boxes and combs immediately the queens are taken out, for fear of introducing another pest to worry beekeepers. On two occasions I have received the whole shipment alive, but it will be seen by the above that the importer cannot reckon on more than 50 per cent. arriving in good condition. Another risk to be taken is the introduction of these queens, for I find that far greater difficulty exists in introducing them after their long sea voyage than a queen hatched in your own apiary or one from our own colony. I have lost several in this way, some by carelessness and haste in introducing, and others through no fault of my own. On two occasions, after having been accepted and laying one or two days, they have most unaccountably disappeared. Another one persistently swarmed out after laying for three or four days, but I at last succeeded in forcing her to attend to her duties by taking all the

old bees away. I was loth to cut her wing, for it not only mars their beauty, but is often the cause of their being lost or killed at swarming time. This queen has since turned out to be the finest I have ever seen. This difficulty of introduction arises, I fancy, through the strong unpleasant odour caused by bees being locked up so long and by the bees that have died on the voyage; for after being accepted once they can be as readily reintroduced as the native queens. The wonderful quietness of the Lignrian bees whilst being handled, their prolificness and great honey-gathering qualities are so well known that they need no comment from me, and, in my opinion, well repay the apiarist for the trouble and expense of obtaining them."

Several members related their successes and failures in importing queen bees from Italy. The failures were often caused through mistakes when introducing the queens after arrival.

Mr. F. A. JOYNER called attention to an article on *foul brood* in the *Australian Bee Journal*, commenting in most favorable terms upon the South Australian *Foul Brood Act*.

Mr. C. A. DICKINS said he had been very successful in introducing queens. His practice was to introduce the queens on the frames in round-top cages, keeping for two days, and then releasing her. If the bees would not then accept her, he smoked with vine leaves, which he found to be nearly as strong as tobacco. He had an imported queen which would persist in laying only on one frame, although he shifted it from place to place in the hive. She would lay as many eggs in one cell.—*Garden and Field* 7th Feb, Adelaide.

VICTORIAN BEEKEEPERS' ASSOCIATION.

A MEETING of this Association was held at the rooms of the Public Service Association, Melbourne Athenæum, on 16th January, at 8 o'clock, Mr. Ellery, President, in the chair. There was a small attendance of members, and apologies were received from several who were absent in the country. The Hon. Secretary, Mr. J. H. Kitchen, was also absent, in New Zealand.

It was proposed and carried that the Chairman be requested to see the Executive Commission of Centennial Exhibition, to endeavor to have a reservation of space to allow a combined exhibit to be made of Apianian products and appliances from various colonies, instead of having them scattered about in various parts of the Exhibition.

The Secretary was also instructed to write to all kindred Associations and large Apianists, asking their co-operations to secure one combined exhibit.

After a pleasant and profitable hour spent in discussing various matters of mutual interest, the meeting closed at 10 o'clock.

Original Contributions.

INTRODUCING QUEENS.

WITH the introduction of the different races of bees, especially the Italians, queen-introducing became a necessity, and is now in use all over the world. We know of different methods by which a fair success is gained, but by each method there is some risk, and a queen will be lost now and then by the best known method of introducing. I have introduced thousands of queens, and have tried all the different methods known, and for this reason, do I say that there is some loss, even by the best known method. The weather, the honey-crop, the time in the season and the time in the day, the strength of the hive, the age of the bees, the position of the hive, the honey in stock, brood, comb, &c.—all this is of influence and consequence in introducing. By carefully considering all these circumstances, we are guided to more and more perfect conclusions.

Our reasons for introducing are several. A colony of bees may have lost its own queen; or a queen is getting too old, or she is not up to the standard for laying in the breeding season; or a new race of bees, or fresh blood, is to be established. It is due to this latter circumstance that introducing is required to so great extent. Happily, the bees' nature has been studied thoroughly, in consequence of which, ways and means are open by which the desired design is obtained. We may introduce:—

- 1st. Brood; eggs laid for workers, and young larvæ not over three days old.
- 2nd. Queen-cells eight to ten days old.
- 3rd. Virgin queens.
- 4th. Fertilised queens.

In order to introduce brood, from which queen-cells shall be started, and one or more young queens raised, it is absolutely necessary that the hive, which has to rear these cells, should have no queen and no young brood *less than six days old*. To attain this, a queen is removed from one hive, and six days after all started queen-cells are destroyed; while at the same time a comb, or a small piece of comb with eggs and young larvæ, is given to them from the hive from which the young queens should be reared. The bees soon perceive the loss or destruction of their queen-cells, and they begin fresh ones from the brood just given. After five or six days it is ascertained how many queen-cells may be to spare, as this hive requires one only, and accordingly to the number of spare cells, as many other colonies are made queenless at once by removing their queens. On the ninth or tenth day from the time when the brood was given, all other queen-cells are cut out but one, and one is inserted in about the centre of the brood nest of each of the queenless colonies. From two to six days hence the

queens should be hatched, if the cells were not damaged or shaken by inserting them; in which case the bees will have removed the cell and started fresh ones from their own brood, should those started before inserting, have been destroyed. To be able to give them in such case another queen-cell at once, another hive should be treated for rearing queen-cells in the same manner as the first, but about six days later.

A few *nuclei* could also be made with so many queen-cells from the first lot, which queens could be introduced to those hives whose queen-cells have been destroyed, and should there be no use for them in this respect, they could become fertilised in the *nuclei*, and then be introduced to strong colonies.

From the above remarks it must be noticed that brood, from which one or more queen-cells are to be reared, can only be given to such hive or hives, which have no queen, no queen-cells, and no young brood; while queen-cells nine or ten days old and young queens may be introduced to hives which are at least two days without a queen, and which may have young brood. It is generally believed that the bees would not take to a nearly mature queen-cell when they are only just starting queen-cells of their own; but that is without foundation. If a colony is not very strong (as long as they are not crowded in the brood room they are considered not very strong) it has no objection to receive a queen about nine days earlier. As soon as the young queen has left the cell she looks about and destroys the rest of the queen-cells. This saves the beemaster the trouble of destroying them. But should a hive be found to have no queen-cells of its own, it is now time enough to destroy them, and insert another, or give some young brood, from which queen-cells will be reared, and as they make more than one, the surplus may be used in other hives or *nuclei*.

Strong colonies, in the swarming season, will usually rear queen-cells of their own, besides the inserted one, and when the queen from the given cell has hatched, she is not allowed to destroy the others; but as soon as they are ripe the first will leave with a swarm. This indicates that strong colonies are not inclined to accept directions in the shape of queen-cells, or even fertile queens, as I shall explain further on.

To introduce virgin queens is of very little use; it is combined with more risk than introducing queen-cells, and, therefore, not often done. A queen, which has just left the cell is easier accepted by the queenless bees than one some days old.

We come now to the 4th, and I consider the most important case of introducing, viz.: Fertilised queens. Such queens may be introduced at any time, as long as the bees have no other queen, and no queen-cells.

But how are these queens to be got? For the last ten years I have reared about five hundred queens each year, partly in stock-hives, and partly in queen-rearing boxes. These boxes measure about 350 cubic inches, hold three small frames, with a couple of hundred of bees, and they are excellent for the purpose. A queen gets impregnated here as well—in fact, earlier than in a stock-hive—while the operations are easier and quicker performed. Two days after a queen becomes fertilised she begins to lay eggs, and she may now be introduced to a stock-hive, if wanted; or she is left until the young bees begin to hatch, which prove of what quality the queen is. If her progeny proves to be pure she is introduced in a stock-hive, where an inferior one is removed; should the progeny prove cross-bred she is at once killed.

About three days after the queen has been removed this little hive receives a queen-cell of about nine or ten days old. Four or five days later it is ascertained if the young queen is out, and if so her color is marked. If no queen can be found, and the cell is destroyed, their own cells are destroyed, if any, and another cell is given. Each little box supplies about 10 queens during one season, especially if the queens, or some of them, are taken soon after they begin to lay; and as we use thirty such boxes, we rear about 300 queens in them each season. The queen-cells are all reared in strong stock-hives, and taken when ten days old. All these queens reared in the small boxes are introduced to strong stocks, and at any time in the summer season, while in winter no queens are reared. Therefore, I need not say that different methods are used and tested, and that I have noticed cases which would puzzle many an amateur, and some would boast as if they discovered a new America. In page 6, "Something New About the Business" is such a blow. I am unable to see the New, practical or theoretical. The circumstances are natural, but not new; while the conclusions are wrong, and without fact. But I would take too much space to criticise said New's; the practical beeman requires no guide in this respect, and the novice may be satisfied with a hint.

It remains now to explain how impregnated queens may be introduced.

To let the new queen run into the hive and amongst the bees as soon as the old one is removed, or a few hours afterwards, I have abandoned. I cannot admit that this is the best method. Therefore I cage all queens for two days. My cage is a tin rim, of three-quarters-of-an-inch by $1\frac{1}{2}$ inch diameter. One end of this rim is covered by a wire netting, and which forms one-quarter-of-an-inch of the rim also, so that the cage is 1 inch broad or deep. The queen is caught in this cage, and placed on the comb in about the centre of the brood-nest, on a spot with no brood, but a few

so the queen has something to live on, cells of honey, although the bees will not let her die for hunger, even if they were to kill her was she free. The cage is screwed into the comb to the midrib; it cuts its way easy and neatly, the next comb just touches the wire-top, and keeps it from falling off. The bees soon fasten the end cells close to the cage, which keeps it in place, as they now begin to remove these cells which touch the cover. A space of one quarter inch all round is of wire net, through which they get known to each other even if they do not remove the cells touching the cover. Some bees try to bite their way through the wire to attack the queen; others (young bees) reach their tongue through it, and feed the queen. She receives the odour of the hive and the bees, and they get used to her. Two days is generally sufficient to make their acquaintance, and the cage is removed. Care must be taken not to disturb the bees, or else they begin to pinch the queen on her wings, legs, etc., when she gets frightened and tries to escape. The bees, well knowing how they have to depend on her, prevent her escape in a peculiar way by surrounding her; but soon the whole lot becomes excited, and what they begun in a protecting instinct ends in the massacre of the queen. Having well studied their ways, we avoid all disturbance, and release the queens mostly towards evening; the bees are then tired and well-fed. For the next three or four days they should be left alone, in which time she has gained full sovereignty. It can generally be noticed whether the bees like the new queen, or not. When they like her, they run about the cage with their wings open; when they dislike her, they bite the wire, in which case it is better to leave her caged for another twenty-four hours. Sometimes we do not remove the cage, but with a penknife we make a hole in the comb from the opposite side of the cage sufficiently large enough to let the queen pass out. This has saved many queens as they got free when all was quiet, and the bees went into her cage before she came out. This method is certainly safer than the one in which a wax plug has to be removed by the bees to make the queen free. The reason is plain and easy to perceive. Of other methods I need make no remarks, as they are less useful.

To make this matter as plain as possible it is necessary to say a few words as regards the conditions of the hive into which a new queen shall be introduced.

I have found it of little or no difference whether the new queen is introduced as soon as the old one is removed, or whether she is given a day or two after. But if a hive is queenless for more than two days (from two to seven), I found it best to destroy all queen cells before the queen was released, and if a hive is queenless from five to nine days, the

queen-cells should be destroyed on introducing the queen. A colony which has no young brood and no queen-cells, is totally queenless, and accepts a new queen willingly. Such colonies that do not fill the brood-room, accept a new queen willingly, as a rule, whilst those that crowd the brood-room feel inclined to swarm as soon as a change of queen takes place. This shows that under such circumstances it is best to keep them queenless for six days, then destroy all the queen-cells, and give them the new queen. A better plan is this:—Take about five frames with capped brood, with all the bees on the combs, and cage the queen from a strong hive, and place the frames and bees in an empty one on a new stand, and insert the caged queen for a day or two. All the old bees return as a matter of course to the old hive, but enough remain behind, and thousand or more hatch every day, so that in a week's time this is a nice lot of bees. This plan has not failed, and for the simple reason, the old bees returned to the old locality, while the young ones remained, and young bees take to a new queen most willingly. I also found that a hive which swarmed a day or two previously received a new queen willingly, the queen-cells being destroyed on introducing her. A hive that lost a queen by her marriage flight receives a new queen readily, if given soon after; but if they were queenless for several weeks, they have killed two and three queens given in succession, and some brood had to be given to get young bees into the hive and with them a queen.

The hive into which a new queen is to be given must not only be not over-crowded with bees, and it must also have empty cells. It is therefore necessary to extract full honey combs before the queen is introduced. When the honey-crop is scarce, and robbing the order of the day, great care must be taken to avoid robbers from entering the hive which has got the new queen or she is sacrificed. Therefore, a queen may be introduced at any time in the day, but she should be released towards evening.

We come now to the question as to the time in the season when a queen may be introduced, and I may say that we introduce them at any time in the summer season, and such hives are selected as suit the circumstances. Now I have often heard the remark—it is too late in the season, although it is in February or March. I consider these months, and April and May, if the latter is nice and warm, as suitable for the purpose as September and October, and preferable to the swarming season, because in the latter end of the season the bees have given up swarming, they are not so strong as in the height of the breeding season, and in consequence more suitable for the introduction of the queen. Moreover, some queens may be too old and not fit for next season, so if they are removed then, and young ones introduced; it is a step in the

right direction. I would advise those who wish to get the Italians not to let their opportunity slip, it is certainly as good, if not better, to have a stock established before the winter, as in next Spring. The wintering is the beginning of the next season. I do not presume that I have explained all that could be said on the subject, but I hope and believe that the above will be a guide, and lead to successfully introducing queens.

W. ABRAM, Manager,
Feb. 6, 1888. Italian Bee Co., Parramatta.

EXTRACTING AND EXTRACTORS.

THERE is an art in extracting honey from the comb, and every beekeeper should acquire it, or the process will otherwise become a very messy (or, as our American friends call it, "mussy") undertaking. To extract comfortably and efficiently requires certain conveniences, and a methodical mode of proceeding. A great deal will depend on the Extractor, the state of the combs, and the age of the honey, but much also on the operator.

To such of our readers as have had no experience in this part of apiculture, we may explain that by extracting, we mean getting honey out of the comb, without materially damaging the latter, by means of centrifugal force; that is, the combs in frames are placed in a kind of wire-net basket, which can be made to revolve very rapidly within a large cylindrical vessel of tin (or other material). The combs are so placed that the cells of one side look directly outwards from the centre or spindle around which the basket revolves, and so when revolved, and a certain speed is attained, the honey flies out from the outer cells, and is projected against the inside of the outer cylindrical vessel, and thence runs down to the bottom, to be afterwards drawn off into other receptacles. When the honey has been thrown out of one side of the comb, the latter is reversed in the basket, and by continuing the rotation, it is thrown out from the other side. The speed required to throw honey out perfectly will depend on its thickness or viscosity, which again depends upon the age of the honey itself, and on the temperature existing during the operation. Honey that is unsealed is thrown out easily, unless the weather be very cold. Sealed honey requires more speed, but comes out readily in warm weather; old sealed honey, however, is generally very viscid, and is thrown out with difficulty, except with a high speed in very warm weather, and will not come out at all in cold weather. The thicker the honey, and the colder the weather, the more difficult extracting becomes, and the higher speed is required. It is always wise, therefore, to choose warm weather for extracting, unless one always extracts while the honey is new, thin, and unripe. Combs having unsealed brood in as well as honey

require careful management, for the brood will be thrown out with the honey unless the speed be low; and as a rule none but experts should try to extract from combs containing much brood; for even should the speed be insufficient to throw out the brood, it appears, very probable that it may be injured by the partial displacement it undergoes by rapid rotation. After the combs are thus emptied of the honey, they are placed back again in the hives, to be again filled; and it will be at once seen how superior this plan must be to the old one of "robbing" where combs are cut out from a hive to obtain the honey, compelling the bees to build new comb, at a great cost of time and stores, before more honey can be gathered; whereas, by the modern plan, the bees continue their gathering uninterrupted by the necessity of staying at home, clustering, and secreting wax for comb building.

Let us now say something about Extractors. Until about fifteen or sixteen years ago, all honey was separated from its comb by "draining," "running" or squeezing—the best honey being that "drained" from new combs, free from brood or pollen. The process was slow, and only part of the honey could be drained out. Most beekeepers, in order to get all the honey possible, adopted the squeezing process, which too often resulted in honey contaminated with pollen and crushed grubs, besides destroying the combs for any further use by the bees leaving only the wax.

About fifteen years ago, Herr von Henschke devised a machine for throwing the honey from the combs by centrifugal force—a course suggested to him, it is said, by seeing a boy playing a trick of splashing honey from a comb tied to a string, by swinging it rapidly. Henschke's machine was a wire net cage, fixed to a spindle, which was made to revolve rapidly inside a wooden tub, just like one of the old centrifugal machines used in sugar factories, or for drying clothes in a laundry. The honey was thrown out of the combs inside the tub, it collected at the bottom, and was run off through a spigot. Other contrivances soon followed, and we hear of honey slingers and extractors of various kinds. Some were made like a rather deep, square tray, of tin or zinc, the size of the combs or frames used; this tray held within it a frame of wire netting, on which the comb was laid; this was hung on a horizontal bar or rod, by means of cords or strong wires from the four corners. By placing one end of this rod in a hole or notch in any upright, and holding the other in the hand, and by a little dexterous motion the "slinger" could be made to revolve rapidly around the rod in a vertical plane, and the honey thrown out of the comb in the square dish-like receptacle; by reversing the combs on the wire netting the honey was extracted from the second side, while the comb was by no means injured. A

very similar arrangement, in which the rod is worked vertically, by means of a point at the lower end, which is steadied by a hole in the floor, and the tin receptacle rotates horizontally, is now advertised and sold under the name of "The Little Wonder." One or two improvised and economical forms of this, made from kerosene tins and common wire netting, have been exhibited at our local Associations. These simple arrangements are effective, and do their work well; still, it is at the cost of a good deal of labour, which, however would be much reduced if, instead of one comb and receptacle, we had another exactly opposite to it to balance it. This is what is done in the ordinary Extractor: the comb basket carries a comb or frame on each side of the spindle, and if these combs are about equal in weight, the labor of turning is very slight; but it increases with a disagreeable vibration if the weight of the two combs or frames differ much one from another.

(To be continued.)

Extracts from Foreign Journals.

COMB IN SECTIONS: WHOLE SHEETS OF FOUNDATION AND STARTERS.

British Bee Journal.

ALL advanced beekeepers are fully cognizant of the utility of having a good supply of sections, filled or partially filled with comb, ready for the coming season. These sections are as a rule the residue of the previous year's harvest. When the racks are removed from off the hives, preparatory to putting the bees into winter quarters, quite a number of the sections will be found to be partially filled, mostly, though not always, with honey of poor quality. This is extracted, the sections returned to the hives for the bees to clear out. They are then carefully packed away, and brought out again when the time has arrived for the racks to be placed upon the hives. The plan of "tiering up," which is quite a modern—even in the bee world where everything is modern—system of obtaining honey, gives a much larger number of these unfinished sections than the plan before adopted of using but one rack, removing the full sections and replacing with empties; hence at the commencement of the following season, when the first rack is placed on the hive, the beekeeper will most likely fill this with these partially filled sections, with the result of having a very irregular lot for his first crop instead of being the best. The plan of putting some partially built combs in the first rack placed on a hive at the commencement of the harvest is greatly to be commended its advantages being very evident, but only inasmuch as it acts as an inducement for

the bees to "go up" in the supers—nothing more. This inducement can be easily proved by filling some sections with comb and others with foundation, and giving them to the bees; those filled with comb will be rapidly occupied while for some time little attention is paid to the foundation. We find that when the bees once take possession of the racks they will never leave them again during the honey-flow, providing no swarming takes place or disease thins their numbers. If the racks are occupied honey only as a rule, will be stored in them, as a consequence more room is given the queen for her to fill with eggs. This gives a great impetus to the colony, and, unless more space is given, swarming will take place. This large increase is just what is wanted. The hive is enlarged by giving an empty rack of sections, swarming is retarded, and we then obtain a greater amount of honey in the supers. It is my purpose to call particular attention not to supering and its various methods, but more particularly to the fact of sections being badly finished where partially filled ones from the previous year are used, and the means by which this can be avoided. This only applies to those sections which have been about three-quarters to wholly filled with comb, not to those which have the foundation (starter) just started, as little or no difference will be perceived in the finish of these. We shall find that the side cells of the offending sections are scarcely touched, which gives the finished section quite a convex surface. There is little doubt but that this arises from ripe honey being taken from the combs below, and stored direct into the sections. Being ripe this is sealed over as soon as the cell is full, the bees not elongating the same as they do in newly built combs, and a little later on in the season when unripe honey is being stored. In these cases the comb-builders keep adding to the depth of the cells instead of sealing them over, the honey not then being in a fit condition. If we can once start them on to honey-comb building they will continue to add to the depth of cells until the opposing comb or separator prevents any further addition. They are then—the honey being ripe—sealed over. Where a comb is provided with cells much below the usual depth of honey-comb, and there being no opposing comb or separator, the bees will at once add to it: and as they have once commenced in earnest so will they continue. All things being in a normal condition, therefore our plan is evident. All sections which are full of irregularly (convex) formed combs should be reduced until the cells are less than half-an-inch in depth, by simply shaving them with a sharp, warm knife. If this is done the bees will finish them off equally as well as with foundation. It is a deal the best plan to place but two or three of such sections in a rack, the rest to be made up of those having only foundation.

The superior finish of sections where whole sheets of foundation are used is very marked. Especially is this so where the foundation fits the section exactly except at bottom, the bottom being fitted with an upright very narrow strip ($\frac{1}{4}$ -in.) almost meeting the larger upper piece, a plan first introduced by Mr. Cornell, of Canada, but in this case—in fact, as in all—the hive must be perfectly level, so that the upper portion of foundation hangs perfectly true to the lower.

I have experienced during the past season a great difficulty in securing whole sheets of foundation perfectly true in the section, there being more or less "buckling" just where the sheets touch the sides, which to obtain finely finished sections must not occur. I have overcome this failing by using a machine which by the almost momentary pressure of a lever affixes the foundation with molten wax firmly and truly in position, a description of which I will give in a future letter. By fixing the foundation with molten wax quite a quantity of it is saved in comparison to other methods, such as "mashing" about a quarter of an inch of the edge into wood, or fixing it in a slit of the top bar.

Many prefer starters only in the sections; I do when I have to eat them myself, in fact, when running a few hives just for home consumption, I recommend a little foundation to be used in supers as possible; just a start that the combs may not get into a muddle. With the machine before alluded to this start can be placed in the section without the use of any foundation whatever. What is nicer than eating a section where the necessity of disengaging a sticky lump of wax is avoided? and this most assuredly will be the case in most instances where whole sheets are used, no matter what make or thickness of the foundation. The plan of using white bees(?) wax, so much in vogue now, does not alter this condition of things, as natural colored bees-wax is made as thin, and even thinner, although, on account of its color, it does not appear to be so.

There is no doubt that the public taste (optical) for a finely finished section will gain the ascendancy, and whole sheets of foundation will have to be used where a market is to be made, but this will not prevent the home consumer from indulging in an article that can be eaten without the above disadvantage.—W. B. WEBSTER.

WHITE CANDY is made by boiling gently 10-lbs. of granulated cane sugar in three pints of water for about ten minutes, well stirring meanwhile. The pan is then placed in snow or iced water, and the thickened syrup stirred until it becomes a consolidated white mass, when it is rolled and patted into cakes. Given to bees above the frames, it is more easily consumed than ordinary candy, since it contains more water, but not enough to cause deliquescence.

Correspondence.

No. 54.—It may be interesting to the readers of this Journal to hear that at the Centennial Agricultural Exhibition in Sydney, the Italian Bee Company received all first prizes for honey and Italian bees, viz.:—(1) Twelve 1-lb. sections; (2) six 1-lb. sections; (3) large frame of honey; (4) small frame of honey; (5) Italian bees in observatory hive; (6) twelve 1-lb. jars of extracted honey. The above awards deserve attention, especially the first four prizes, which were all for comb-honey, as a good deal has been written, and it is often believed, that the Italian bees do not build so white comb, and do not seal the honey so nice as the Black bees or Hybrids, when it must be understood that the Italian Bee Co. has none but the Italian bees; while, besides their exhibit where those of able bee-men, who have Black and Hybrid bees only. It is also worth mentioning, that the Italian Bee Co. uses the Berlepsch hive, which was considered by "Apis" as unsuitable in comparison with the Langstroth. But the product proved to be worth first prizes, while that of the Langstroth hive proved to be unsuitable for such an honor. This was the first exhibit by the Italian Bee Co. for competition.

W. A. M.

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Editorial.

HINTS FOR APRIL.

If the weather be at all favorable, bees in good localities will still be bringing in some honey, and where late Eucalypts are flowering, will do so pretty briskly; nevertheless, in every apiary will be found some stocks which, from want of strength or late swarming, or other cause, are very short of stores. When this is the case it will pay well to feed freely, and encourage a little late breeding, so as to have plenty of young bees to begin the Winter with. If stocks are found really weak, as well as short of stores, uniting will be the proper course to pursue, and try and have most of your stocks, with bees enough to cover five frames thoroughly, before the middle of May. The success of next season depends very much upon preparations in April and May. Where queens are old, or have been producing an inordinate quantity of drones, they should be superseded not later than early in May, and young queens introduced. When the Spring honey season commences, instead of having weak stocks, which occupy all the first part of the season in getting up to working strength, we shall have our hives running over with bees, and ready to store in supers at once. The same principles as are followed in rearing other stock, must be observed in apiculture—good strain, young and vigorous mothers, and avoidance of in-and-in breeding. This matter of superseding old or damaged queens, or queens that have proved unsatisfactory, is one of the keys to success in apiculture, and should not be neglected in April if we want a lively start in Spring.

With frame hives it will be best to remove all frames with no brood, and not covered by the bees, and put in a division board, so as to contract the hive to just the number of frames the bees will cover comfortably, and not allow

them too much range over a lot of empty combs. The combs removed should be carefully put away for the Spring, when they will be found very useful to return to the hives as the bees increase. Make provision for feeding during the Winter months if necessary, and to ascertain if it be necessary, weighing the hives from time to time, as described on page 20, is a good plan. Of course, one can see by lifting out the frames whether the bees have sufficient stores or not, but we are convinced that the less our hives are opened, even during our mild winters, the better it is. Last year we weighed our hives about the middle of April, and repeated it every month, feeding only where the weight showed that there was less than 5 or 6-lbs. of food.

As to the matter of food at this season, we would say a few words. It has been strongly advocated in these pages that nothing but honey should be fed to bees, and we quite agree to this on one condition, that we are quite certain that the honey we use does not come from diseased colonies—and, it appears, we cannot be sure of this unless the honey comes from our own apiary, and that itself is clean and healthy. We certainly can buy cheap honey, and boil it to destroy any germs of disease it may contain; but honey that has been boiled is no more nor less than syrup, all its aroma, formic acid, essential oils, and other volatile constituents have evaporated. Sugar syrup, converted into uncrystallisable or grape sugar syrup, is therefore a clean and safe substitute, and one that is used by all the owners of large apiaries in England, Canada, and America. It must be remembered we speak of feeding to keep the bees from starving, not feeding to fill sections, or frames for extracting.

Plain sugar syrup is very apt to crystallise in the cells of the combs, it is best, therefore, to convert the sugar from cane sugar to grape sugar. This can easily be done in several

ways, the best, however, we think is, make the syrup of 8-lbs. of sugar, 3 pints of water, and a quarter of an ounce of tartaric acid—bring it to the boil, keeping it stirred, and continue the boiling for 10 minutes. After this the sugar will not crystallise out of the syrup.

INTERCOLONIAL BEE NEWS.

NEW ZEALAND. — The *Australasian Bee Journal* for March has come to hand, and is full of interesting matter. A meeting of those interested in Apiculture was called together at a meeting in Auckland for the 7th of March, when it is hoped that the old New Zealand Beekeepers' Association will be resuscitated. Among the correspondence is the following letter, giving an account of an experience with "Grimshaw's Apifuge" in manipulating bees, which will, no doubt, be interesting to our readers.

"Sir,—You will probably recollect that my friend, Gapt. Armstrong, obtained from your firm some short time since a bottle of Grimshaw's Apifuge. I wish now to give yourself and the readers of the *Journal* an account of his and my own experience of the use of it. Yesterday I paid Capt. Armstrong a visit, and, as usual, I had a look at his bees, but before doing so he reminded me that he had the Apifuge, and requested me to try it, stating that he had already tried it himself on two or three occasions and found it an unqualified success. Following the directions on the bottle I rubbed a drop or two over my hands, and being determined to give it a thorough test, I commenced to manipulate a hive containing a strong colony without smoke or veil. Removing the cover and tearing off the mat in a rough manner, calculated to irritate the most docile bees, the inmates of the hive came "boiling" up over the tops of the frames and elevating their business ends ready to wreak vengeance on the intruder. But before they had time to make up their minds to begin the attack down went my hands among them, and, as though by some magic influence, their threatening attitude seemed to be instantly changed to one of the greatest respect, apparently knowing that they were in the presence of a power greater than their own, and so far from making even the slightest attempt to sting, the bees appeared anxious to get as far away from me as they could. Without the least ceremony or care, with regard to jarring the hive, I removed frame after frame, and purposely did all I could to irritate the bees, but not one sting did I get, though I am certain had it not been for the Apifuge I should have been stung unmercifully. I manipulated another colony much in the same manner and with the same good results.

The effect of the Apifuge upon the bees is most marvellous, in fact, without personal experience of it, I could scarcely have credited

that anything could have subdued them so quickly and completely. My opinion is that when it comes to be better known you will have a very large sale for it. I am told that it is equally as effective in keeping off mosquitoes, and I know of one person who is using it on his horses to keep the flies off their ears and nostrils. So very little is needed for use at the time that a bottle will last for a long period.—Yours, etc.,
O. POOLE.

January 10, 1888.

[The Apifuge is indeed a wonderful preparation in its effects upon insects. The ingredients appear to be rather expensive, but as no more than a drop or two is needed for rubbing over the hands a bottle of it will last with care for two seasons. With this at our command we need not fear Cyprians nor the most vicious Hybrids. Our stock was small, it being only a trial lot, but we shall keep a large stock on hand in the near future, when we hope to be able to reduce the price considerably.—Ed.]

HONEY FROM THE PRICKLY BOX.

We have been favored by Mr. F. Price, of Narracoorte, with a very peculiar sample of honey, which he tells us was gathered by the bees solely from the prickly box or *Busaria Spinosa*. This tree is found in many parts of the country, and is called indiscriminately prickly box, or native box; it blossoms freely in January, and although we have noticed very few bees about these trees in the vicinity of Melbourne, there is no doubt they would be freely visited where other foliage is scarce.

Mr. Price, in reply to our query as to the source of this sample of honey, writes:—"Your letter to hand re sample of honey sent to Mr. Kitchen. It was gathered solely from the prickly bush, or native box, or prickly box, the tree bears all these three vernacular names. The botanical name is *Busaria Spinosa*. I may state that I am not at all mistaken as to the source of the honey, as during January the *Busaria Spinosa* was the only native tree in blossom, and I had every opportunity of ascertaining where the bees were foraging, as a thick scrub of it grows only a quarter of a mile away, and I was extracting every week."

The honey itself was bright and clear, had a marked odor of the bitter almond kind, and a most disagreeable, acrid taste. It was quite unfitted for table use, although useful for feeding bees in winter, and perhaps for making mead or other honey drinks. This information regarding one of our freely flowering native trees is valuable, and of the kind we are very desirous of getting. We want to be quite sure of what plants supply good saleable honey, and the plants that produce honey unfitted for the table, or that would deteriorate other honey if mixed with it. We are, therefore, much indebted to Mr. Price for his kind communication.

MEAD OR METHELGIN.

ONE of our subscribers asks us to give a receipt in our next for making mead, and we have much pleasure in complying with his request, and giving him and our readers generally full information on this subject.

Honey consists chiefly of two kinds of fermentable sugar (which is different from our ordinary cane sugar) and water. It appears that the bees actually gather the sugar in the nectar of the flowers, as cane or crystallisable sugar, but that becomes converted by the saliva of the bee into what the chemists call *dextrose* and *levulose*, two forms of sugar, exactly alike chemically, but having certain different physical properties. Dextrose is crystallisable, and levulose not. Now, these sugars are fermentable, the levulose most so; in fact, honey is as easily converted into alcohol or vinegar, as brewers' glucose, to which it is very closely allied.

Honey can therefore be used instead of glucose or sugar in all kinds of fermented drinks.

The most common drink made from honey is known as *mead*; the old fashioned way of making it was to mix honey and warm water together, of such a consistence that a new laid hen's egg would just float in it; if there was too much water the egg would sink; if too much honey the egg would float too much above the fluid. To this mixture a little yeast was added to produce fermentation, which at a certain stage was stopped by the addition of some spice or bitter herbs, and bottling. Mead made this way is a moderately strong drink, and apt to produce headache unless very old. It should be kept many months in bottle, when it will much improve.

The recipes for making mead, or methelgin, as it was called in olden times, are too numerous to refer to here. We shall content ourselves with giving two or three of the formulas for making the most wholesome kinds.

Most people nowadays know how to make hop beer, dandelion ale, &c., and if in making these we use honey instead of sugar, we have a more wholesome and rather a more pleasant beverage. Honey makes splendid vinegar, and no better use can be made of coarse, bad flavored, or refuse honey than by turning it into good vinegar. To do this, take one measure (a pint, quart, gallon or more), and mix it with four measures of water. Expose it in an open vessel to the sun, with mosquito or wire net over it to keep out insects, and in about five or six weeks it will have become an excellent fine flavored vinegar.

From Newman's "Bees and Honey" we extract the following:—

Methelgin.—Mix honey and water, strong enough to float an egg; let it stand three or four weeks in a warm place to ferment; then drain through a cloth and add spices to suit the taste.

Wine Mead.—Three pounds finest honey to two gallons water, the peel of two lemons to each gallon; boil and skim well. Start it fermenting with yeast, after fermentation has thoroughly set-up put it in a jar or cask, lightly bunged, for several months to mature, then bottle off.

Harvest Mead.—20-lbs. honey, 12 gallons water, whites of 6 eggs; boil together an hour, then add cinnamon, ginger and cloves, and start it with a tablespoonful of brewers' yeast, and in 24 hours it will be fit for use, and a capital drink for hot weather.

In the United States of America beekeepers preserve a good deal of fruit in honey, and it is said to form a most delicious preserve.

HIVES.

Continued from page 118.

An enquirer asks us to point out wherein a frame hive is so superior to a box hive in the results it furnishes as to warrant its purchase at a cost, say from ten shillings to a pound, when a box hive can generally be got for a shilling? This is not an easy question to answer plainly and satisfactorily, as the reply must depend on a variety of circumstances.

First, we will take the case of two beekeepers, each with say two stocks of bees, one in box hives, which have cost say, half-a-crown for the lot; the other, in frame hives, costing from 10s. to 12s. each. It is generally found that not more than half the number of hives in an apiary will turn out decidedly profitable, except in an unusually good season.

Swarming time comes on, and the box hives each give off a prime swarm, and probably two after-swarms, for which six boxes have to be bought, costing say six shillings; he has now eight stocks of bees in eight boxes, the outlay for boxes being 8s. 6d. We will assume he sells two of the best of his two after swarms say, for 10s. each, the last being in all probability a very weak one. If the season be good his first swarms may themselves throw off a swarm about Christmas, or some time in January, which will likely enough be followed by a weak after-swarm. He may sell two of these swarms which will, so late in the season, be worth no more than 7s. 6d. each. He has now eight stocks, four probably weak, and four moderately strong. If there has been all this swarming there will be very little honey at the end of season, and he will be fortunate if from the four strongest hives left, he can obtain 40lbs. honey (by cutting away the outside combs) without leaving his bees too short for winter supplies. Of course if his original stocks only swarmed one each, or if he united second swarms, his return of honey would be much better. This, altogether, would be the result of a good season with a good honey-flow, and a maximum increase by swarming.

His season's profits would stand thus:—

Commenced with two stocks, 12 box hives
cost, say 14s.

Swarms sold	£1 15 0
40-lbs. honey, say at 4d. ...	0 13 4
	£2 8 4

Deduct from this 14s., leaving £1 14s. 4d.
profit, and eight stocks of bees, four good, four
rather weak.

The beekeeper with frame hives, having an
equally good season, both for increase and
honey flow, stands thus at the commence-
ment:—

Two stocks of bees.

Two frame hives, cost 12s. each ... £1 4s.

As the honey-flow commences he manages
his bees so that, as they increase in numbers,
he increases their comb accommodation, and
so delays early swarming, and keeps the bees
at work storing honey as long as he can—in
one hive he puts on section boxes for comb-
honey for sale, and the other he extracts
honey from the outside frames as fast as they
are filled, and at once returns them to be
filled again as long as the honey-flow lasts, or
until the colony swarms. Before the first
hive swarms, which it does early in November,
he has taken off 36 1-lb. sections of comb-
honey, which he sells at 10s. per dozen; total,
30s. The second hive swarmed about a week
earlier, but he had already extracted 28-lbs.
of honey, worth 6d. per lb. Both stocks
threw strong swarms. He has had to buy
two new hives, costing 24s., as well as a pound
of comb foundation, costing 2s. 6d., for putting
in the frames of the new hives for these swarms.
He prefers to have no more swarms from his
original stocks, and six days after the swarms
be taken out the frames, and cuts out every
queen-cell but one (the best and largest) so
that there shall be only one queen to hatch.
If he be a wise and advanced beekeeper he will
put some of the best queen-cells he has cut out
into cages, and place them in the swarm hive
to hatch, in case the cell he has left does not
turn out a good one. The swarms being sup-
plied with comb foundations rapidly establish
themselves, and in three weeks are full of
honey, and hatching bees. The old stocks
both reared their queens, but one got lost in
mating. He discovered this at once, and gave
them one of the queens hatched in a cage,
which was accepted; both stocks laid up honey
rapidly whilst waiting for the brood of the
new queen, and by Christmas he took off 20
more section boxes, and had extracted from
the other hive 17-lbs. honey. The swarms
were now overflowing with bees and honey,
and they each cast a swarm about the middle
of January. They came off the same day, and
he united them, so as only to require one more
hive costing 12s., with 3s. 6d. for foundation.
In March he took from his five hives 50-lbs.
of extracted honey, and 12 1-lb. sections, with
14 partially filled, which he extracted, and

kept for next Spring. By the end of April he
found three of his stocks amply provided for
the Winter, but the other two required feeding,
about 15-lbs. sugar each, costing 7s. 6d.

Now let us see how he will stand at the end
of the season.

Cost of 5 Frame hives ...	£2 10 0
Foundation	0 6 0
An extractor, knife, &c. ...	2 10 0
Sugar	0 7 6

£5 13 6

Honey produce 4 14 6

Excess of expenditure over
receipts £0 19 10

But he has five frame hives, which will last
for many years if painted now and then. He
has also an extractor, &c.; all these are worth
at least £4 10s., so that our frame hive
keeper is actually £3 10s. to the good in the
first year, besides being the possessor of five
strong colonies of bees, with which to com-
mence next season.

If any of the ordinary accidents occur, such
as a stock or two losing a queen, or disease
getting among the bees, the frame hive
keeper is in a far better position than his box
hive brother; for he can, at any time, ascer-
tain the condition of his bees, while, with
box hives the mischief is usually only dis-
covered when it is too late, or at least so far
advanced, as to be difficult to deal with.

In the second year the frame hive apiary
will rapidly gain on the box hive one, if both
have an equally favorable season.

The chief barrier in the way of adopting
frame hives is the first outlay, and the acqui-
sition of the skill to manage them. Whereas,
with box hives there is seldom any manage-
ment, and the bees are left to themselves to
live or die, to collect honey if they can, of
which they are to be robbed, or else they
starve. The beekeeper has very little trouble
and, as a rule, a return in proportion.

(To be continued.)

Proceedings of Beekeepers' Associations.

QUEENSLAND BEEKEEPERS' ASSOCIATION.

A MEETING of the Beekeepers' Association
was held in the National Association's Rooms,
Elizabeth-street, last Monday. The attend-
ance was not large, and the chair was taken
by the vice-president, Mr. R. J. Cribb,
Messrs. C. Allen and H. W. Clarkson were
admitted as members of the association.
Specimens of the Barbadoes Gooseberry,* a
light-colored, waxy flower, were brought in by
Mr. Allen; the members present were unani-
mous in regarding it as a great favorite with

* The Botanical name of this plant is *Peregrina aculeata* and is of easy and rapid growth. ED.

the bees, and it was strongly recommended to be grown by apiarians. In pursuance of the society's operations in detecting adulterations and exposing inferior honey, one of the members produced a very objectionable sample, which appeared to be half water. It is intended when a sufficient number of samples has been collected to get them analysed and to expose dealers in the adulterated article. The notice of motion for altering the date of meeting was discussed and rejected. The vice-president promised to read a paper at next meeting on the subject of co-operation as affecting the sale of honey and the advantages to be derived from such a system. A motion to the effect that all members of the association should be recommended to label their honey was adopted. During a discussion as to the prospects of beekeeping at the present time, it was generally agreed that the season is now at an end, and that the utmost care is necessary to prevent robbing. Mr. Jarrott reported that he had observed a queen mating with a drone in the air. It was stated by the secretary that the books ordered by the association had come to hand, and were now available for the use of members.—*Queenslander*, 3rd March.

SOUTH AUSTRALIAN BEEKEEPERS' ASSOCIATION.

The usual monthly meeting was held on Friday, March 2. Dr. J. A. Cockburn, M.P., in the chair.

Letter from Victorian Beekeepers' Society, asking co-operation in making a display of bees, products, and appliances at the Centennial Exhibition. Resolved that the South Australian beekeepers cannot as an Association co-operate in the matter, but will recommend its members to do credit to their industry by exhibiting as suggested. Letter from Mr. E. Cusack re Foul Brood Act, and promising co-operation, also enquiring whether the postal authorities here provide a special mailing for conveyance of queen bees, and stating that the Queensland beekeepers were moving to obtain this concession. The Chairman remarked upon the satisfactory nature of the bee exhibits at the Autumn show of the Royal Agricultural Society, and the eager crowds of visitors which surrounded the beekeepers' stand. The Hon. Secretary suggested several improvements in the rules with regard to competitive exhibitions. An animated and instructive discussion then followed upon foul brood, the Foul Brood Act, its intention, and the misunderstandings of its scope, and the powers of Inspectors, entertained by a large number of beekeepers, including members of the present Association. One member said he quite understood that the Inspector would have power to enter any apiary, and if he found it infected with foul brood, he could insist upon bees, hives, combs, and everything being destroyed, and it was stated that this erroneous idea was held by a large majority of

beekeepers. It was then explained that the Foul Brood Act provided for nothing of the sort. The Inspector could not order the destruction of anything connected with the apiary, except so far as the combs were concerned, and then only so far as their mechanical structure was concerned. If the combs were melted into wax they would be destroyed effectually in the spirit and letter of the Act. The Inspector could insist upon hives being disinfected if foul brood were existent in them, and he would instruct the beekeeper how to do this. There was no power in the Act to compel a beekeeper to use any particular form of hive, but he must cleanse it if infected. Regret was generally expressed that such a misunderstanding should have arisen, and the speakers felt assured that if a Convention of all Beekeepers' Societies and others could be arranged the matter could be so explained that the present opponents of the Act would become perfectly content to aid in the eradication of a disease which greatly reduces the profits from beekeeping. A motion was ultimately carried to invite delegates from the various beekeeping districts to attend a meeting in Adelaide early next month in order that the subject might be discussed in a friendly manner, or in case such a course were not possible, the Association would appoint delegates to visit any of the large centres with a like object. It was felt that beekeepers all over the colonies should be in accord, but more especially in this colony, and it was most unfortunate that the objects of the South Australian Beekeepers' Association should have been so thoroughly misunderstood. There were only two or three of the members engaged in trade in supplying beekeepers' appliances, and the large majority were amateur beekeepers, joining the Society with the view of acquiring knowledge through its papers and discussions. The aim of the Society was simply to give and acquire information concerning bees and beekeeping.—*S. A. Register*.

News from Apiaries.

THE SEASON in South Australia has been by no means a good one and bees have stored very little. A discouraging account from the possessor of an apiary in the Mt. Lofty Ranges reaches us as follows:—"Bee affairs are very quiet in South Australia; a very poor season indeed is the verdict for 1887-8, and all we now hope for in this district is the possibility of the bees being able to secure enough for the coming winter. As a consequence of this the interest displayed in beekeeping last year has considerably abated, and the attendance at the Beekeepers' Association meetings has considerably fallen off. Foul brood, too, makes the pursuit very disheartening, and deters

many small beekeepers from enlarging their operations."

Our South Australian friends must not expect every season to be good; they had a fine one last year, and we believe that foul brood and bad seasons go hand in hand, a scanty honey harvest in the height of the breeding season gives foul brood a full chance. In the United States last season was a disastrous one for beekeepers, and disease among bees very general, the only good result being that the price of honey has gone up considerably. Although disappointed this year they are looking forward hopefully for the next season, for seldom do two bad bee seasons follow one another.

OUR OWN APIARY.

We are glad to report that despite the unusual and uncontrollable increase by swarming most of the stocks have done well and stored plentifully. Being situated within the suburbs of course big honey harvests are not to be expected, and an average of 20-lbs. surplus which has been obtained this year after such a remarkable swarming season may be regarded as unusually good.

So far we appear to be quite free of foul brood which destroyed so many of our stocks last year, the plan of starting the bees afresh in a new hive, with new frames with starters only and destroying all old frames, brood and and honey seems to be by far the most certain cure of this disease yet tried. We have given no physic, no medicated food, no spraying, simply plain syrup while the bees are building their new combs.

A swarm of Italians which came off in December and which our mau hived in an empty Langstroth hive without frames built their combs from the roof; we decided to leave it as it had so far advanced before we were aware of there being no frames. It now weighs 82-lbs., take from this 24-lbs. for weight of hive, cover and bottom-board, we have 60-lbs. for bees, comb and honey, which is an excellent result for two months' work.

CORINELLA APIARY, MIDDLE BRIGHTON.

In this apiary I have at present 70 stocks, big and little. During the past month the bees have at last settled down and one may breathe a little; I really began to think that the swarming fever would last through the entire season. In consequence of the steady flow of honey and mild weather, nearly all honey coming in was converted into bees as fast as the queens could lay. At present my hives show 6 or 7 frames solid brood right up to the top bar but very little honey, in fact I quite expect shortly to have to commence feeding syrup to keep up strength, bees being to me of first importance. I have had during the season about 20 dozen sections filled but have not extracted at all, and have in fact been

using most of my honey for queen rearing. Have raised about 200 queens from imported mothers and tested a good many. During the past three months I have run in two or three dozen of Kangaroo Island Queens (Fiebig's) and have proved a good many and found them very good; well marked, good layers, very gentle to handle and first rate workers;—what more is wanted? I find Black bees nowhere beside the *little yellow boys* either in this apiary or at Mansfield, in fact they are starving when the Hybrid and pure Ligurian are pouring honey in. I have sold bees largely to keep down stocks, for had I kept all my increase I should now count over 200 hives.

L. T. CHAMBERS.

WETHERSWOOD APIARY, MANSFIELD.

In November last I forwarded from my Brighton apiary 50 boxes 8-frame Langstroth Hives, with bees and young Ligurian queens just commenced laying, to Yea, by rail, but in consequence of careless handling by the railway people I only succeeded in placing half that number in above apiary.

These together with a few stocks of Blacks on hand from previous year and increased by other queens since sent up now count 50 good strong stocks and a few nucleus.

During past two months the extractor has been going pretty well although it was my intention to work solely for box-honey, but circumstances alter cases and I found the weather too cool to do much on the top, so had to extract instead.

So far extracting has given about 1600 lbs. and we hope to get a good many sections finished off yet, but bees are very slow in capping.

White clover yielded splendidly, blooming right along to end of January. Black thistle is a good Autumn crop lasting well through January to March supplying plenty of honey for bees after extracting ceases.

Next year hope to have honey crop from red-gums. Nothing worth mentioning from eucalyptus this year except a few yellow-box and an occasional gum.—Yours, etc., L. T. C.

CLARENCE RIVER.

In compliance with your request I send you the following:—About three years and five months since a swarm settled on my land; I hived them in a small box; the first season they increased to eight colonies—this set me thinking that there must be money in bees. About this time I read an account of Mr. D. A. Jones's apiary, and I at once procured the best works on bees, and set to work. The results are I have to-day nearly eighty colonies, including twelve nucleus hives. About fifteen months since I bought an Italian Queen from the Italian Bee Company, Parramatta, and commenced queen-rearing. I have

only fourteen Black queens at present, the remainder are pure Italians, the majority mated with Black drones. I keep my bees in an open shed, ten feet wide and five feet high to the wall plate, with a gangway up the centre, a row of hives on each side, the hives eighteen inches apart. I use in the brood chamber a frame, 10½-in. deep by 11-in. wide, inside measurement, twelve frames below, and eleven in the supers, 11-in. wide by 5-in. deep, inside, from one to three tiers of frames as required. I am just going to try 1-lb. sections for the first time. The swarming season here usually commences in September, and closes in March. My bees have just now got a very severe attack of the swarming fever, in spite of three tiers of frames over the brood chamber, the covers raised, and an entrance twelve inches wide and half-an-inch deep. The hives have more brood in them now than at any previous time this season; I increase by dividing. Our honey is chiefly from the different varieties of eucalypti and ti-tree. Of the latter there are four varieties; of the former, many; but I do not know their botanical names. Last winter my bees filled their hives late in July from the ti-trees and flooded gums. According to my experience the ti-trees are the greatest honey-yielders here. I believe I was the first to use the frame-hive on the Clarence, and the first to import Italian bees. I cannot say what an average yield is, as I have worked more for increase. Last season my best Italians stored ten pounds of surplus honey per week for several weeks in succession. The bees are very busy just now with the bloodwoods and the late maize. I manufacture my own foundation, press it between engraved plates; but the process is slow and not satisfactory. I wish to try the rollers.

G. GREEN.

Palmer's Channel, Clarence River.

Correspondence.

TRANSFERRING FROM BOX HIVES SIMPLIFIED.

No. 55.—Anyone possessing bees in boxes, intending to rob honey from them at this present season, would do well to provide frame hives to transfer bees and brood into, and so large colonies nicely settled for next season's work, and at same time gave a little insight into the system of manipulation.

The transfer of bees to another box in the usual method of drumming having been accomplished, and the honey having been secured, the question arises what to do with the brood comb, which is usually thrown away, and means very considerable loss to the colony as well as to the proprietor. To save this, and at the same time transfer brood and bees to a Langstroth or other frame hive, proceed as follows:—"Procure 20 strips of

wood, 9-in. long by ¾-in. wide, and ¼-in. thick. Spike in this wire nails through these at distances of 1½-in. from ends, and from each other—which will give five nails at equal distances in each piece—with a fine ¼-in. brad, tack five of these strips on to a frame, spike inward. The quantity above mentioned will supply four frames, which should be sufficient to hold most of the good brood necessary to transfer. Now take the combs with brood that have been cut out from this box hive, and lay them for the projecting nails in the frame, and the whole frame fitted up by a little trimming by a sharp knife. Have also on hand for each frame so treated two pieces of wood same size, also spiked with nails, equal in length to the frame, say, 17½ inches—these to be tacked on longitudinally on the other side of frame after brood is fixed, and so hold the pieces of comb firmly in the frames. This being done, the frames may be hung in the hive alternately, with frames supplied with foundation starters—the bees hanging in clusters in the other box may then be dumped down at the entrance of the hive, into which they will at once run, care being taken that a wide board or cloth be made flush with the entrance of the hive, so that no obstacle prevents their running directly into the hive, they being too full of honey to do any steeple-chasing. Do not transfer any drone comb or honeycomb; the first is not needed, and if food is required better give it a week later, or after things have settled down a bit. The sticks may be all removed in a week's time, the bees having made all fast and solid, so do not fasten on so firmly.—Yours, &c.,

L. T. CHAMBERS.

FACTORY REPORT.

No. 56.—Since starting machinery in September last to present date, I have made and sold, chiefly in Victoria, about 2000 hives—most of which have gone out in retail lots to beginners. I find the greatest interest exhibited, both by amateurs and those who have been keeping bees for years, and the desire to work upon improved principles is daily manifesting itself, and by next season I trust an increased interest may be excited in the frame hive. I have given the 8 frame Bush Hive a good trial, and am satisfied that it is a handy hive, and will give satisfaction. I am now making for my own use, next season, a shallow hive, *a la* Heddon, with a fixed frame and a divided brood nest; to carry any quantity of brood or section-boxes; all parts to be capable of alternation in position. I feel sure for box honey this is the thing—easy to get boxes started. Although I don't believe in the principle of reversing the possibility of interchange in position is a great gain. Section boxes have been in demand, and the machine has had to run pretty frequently. Comb foundation—much called for. Have

· sold about a ton. Altogether I feel satisfied that a year or two will see Victoria well to the fore in the matter of honey production. Gippsland is yielding well this year.—Yours truly,

L. T. CHAMBERS.

Extracts from Foreign Journals.

THE PREVENTION OF OVER-INCREASE BY SWARMING.

IN many parts of Victoria this last season's bees swarmed so persistently, and so frequently, that as many as eight swarms have issued from one stock in the season, where no steps for controlling the swarming fever have been taken. Many apiaries have been quadrupled, and most have been so taken up with swarming that the honey-flow of a good season has been absorbed in raising these swarms. As success in bee culture depends in a great measure on our ability to control swarming, for the benefit of our readers, we give below three essays on the "Prevention of Increase" from the *American Apiculturist*.

(NUMBER ONE.)

E. A. MORGAN.

Prevention of increase of colonies of bees, does not mean to prevent the increase of bees by any means, as this would be exactly opposite what we do to gain the best results, for no beekeeper ever had too many bees in a hive.

Its object is to prevent swarming in a measure, but more especially increase in numbers of his colonies, which is always done at a loss of surplus honey and expense of new hives, combs, and reducing the season's profit. My plan is no theory, but the result of five years' experience with one hundred colonies of bees.

It is as follows: As the preparation begins when bees are set out, I will begin with April 1. In the first place I will say I use the L. give 16½ inches wide, allowing 1½ inches from centre to centre of combs; brood-frames, 9 inches deep, thus it will be seen that I have a broad, shallow hive which I find the best, all things considered, for profitable beekeeping, and as I am a specialist at beekeeping, have been obliged to make it pay. I strive to keep queens that will fill ten combs with brood; this hive will certainly give room for the most prolific queens which, if crowded in a small hive are too willing to swarm out. Then again, if we contract too much, we shall crowd pollen into the sections. This size of hive obviated these troubles.

My belief is that the bees control swarming, and that the queen is always opposed to swarming.

It is, therefore, the bees we must please. Knowing just what they require we may proceed to manipulate them to the best possible advantage.

First, then, in early Spring, when set out, allow one day's flight for them to mark their

location, then examine every colony, taking away all combs not densely covered with bees; then crowd with division-board, being sure they have abundant stores; cover up warm above and pack warm at sides of hives to hold the heat of cluster and hasten brood-rearing; leave entirely alone twenty-one days when young bees will begin to hatch; then examine once a week, adding the combs as fast as young bees emerge to cover them.

The combs should be added to outside of brood-nest, one at a time, as warm weather advances, until all are in. Young bees will now hatch as fast as the queen can fill the empty cells with eggs, the swarm is now a rousing one and the hive packed full of bees, brood in all stages, and honey (the old stores) mostly consumed.

It is now June 1; clover begins to yield and we see the combs begin to whiten. This is the proper time to place on a super filled with sections, having starters in them which will be taken possession of immediately, and honey will be stored rapidly, and if left in this condition swarming would be the result. We watch the super, however, and before it is quite full we raise it up and place an empty one under it, always adding extra room before quite needed, and if the hive is standing in the sun a shade-board is placed upon it. Managed in this way throughout the season swarming is scarcely ever thought of, and not one colony in twenty-five will cast a swarm, as all the energy of the bees is bent upon honey gathering. The strength of swarm is kept up by the queen having all the room she can fill; consequently, the white honey all goes into sections.

But should a swarm issue we proceed at once to profit by it and hive them so that no time is lost for work in the sections. This we accomplish as follows: As soon as all the bees are in the air, we turn the hive clear around so that it faces the opposite direction from what it did; setting it just off the stand.

We now place a new hive on the same stand as the old one occupied and put seven combs or frames with foundation in it. Take three combs of brood from old hive and put in also; then place the super, or supers, as the case may be, on the new hive, and hive the swarm back in it, letting the old hive remain until towards evening. At that time all the flying force will be back in the new hive on the old stand. Now open old hive and shake and brush all remaining bees down in front of new hive, when they will all run in. We now have all the bees of the swarm and all left in old hive on new stand. That colony is now done with swarming for the season. There is a strong field force, no combs to build or supers of unfinished sections to fill up. The bees have gained a new impetus by swarming and the work goes on rapidly; no loss of time, no increase and a double surplus will be taken.

We now return to the old hive, which is taken into honey house, queen cells cut out, honey extracted, and the brood given to stocks not overflowing with bees, to nucleus, or to artificial increase (if we wish such) or still better, held over till next day and a swarm hived on them and treated the same as was the one the day before, as regards *supers*, etc., and so on to the end of the season; when we find we have had half a dozen swarms, and yet only our one hundred stocks in the yard in the fall, the original number in the Spring, following up this method during the season, an extra yield of comb honey can be secured, fully as much, I believe, as of extracted. After July 10, the supers can be contracted to the close of the season, leaving few unfinished sections to carry over. These latter can be extracted and combs kept for the next year. Should I wish increase I should manage my apiary as above until after clover and bass-wood bloom, then divide and let them fill up on fall flowers.

(NUMBER TWO.)

JOHN H. RUPERT.

In preventing increase it is not necessary to prevent swarming; in fact, in working for comb-honey, I prefer to have the bees swarm, as I think they work better after the swarming impulse is satisfied. When the time comes for putting on the sections look the hive over carefully, cut out all the queen-cells, put on the supers and let them alone. If they go to work they will soon need more room. As soon as the first sections are finished take them off and replace with empty ones. With young queens this method will often prevent swarming, but when you put on the supers if they have made preparation for swarming let them swarm; do not cut out cells and fuss with them for they will not work while they are thinking about swarming. Have your new hive ready and as far as convenient from the old stand. As soon as the swarm issues, open the parent hive and remove all the combs but one to the new stand, bees and all, but be sure that you have removed every queen cell. Put in frames of foundation to fill the hive; take the super from the old hive and put it on the new one. By this time, the swarm will be settled in your hiving-box. Now carry them to the new hive and run them in, as you now have all the bees and brood of the old swarm (except the one comb left at the old stand and the bees that are out in the fields); the latter will work with all the energy of a new swarm. Be sure and put on the super before hiving the swarm and the bees will go into it with a rush and stay there. I never use any honey-board and am not troubled with the queen in the sections. I use the L. frame. If I used small frames and ten or twelve in a hive, I would leave two frames in the old hive instead of one. If they should swarm again in the course of two or three weeks treat them

as before; if they persist in swarming supersede the queen. As to the frame of brood left in the old hive, leave it alone till you have bees enough to fill a hive; then unite the colony at sundown, remove the empty hives, put on the super and the bees will go to work promptly. With this plan, you will have only one new swarm out from eight or ten old ones, and still have them in the best condition for storing surplus. I think they work with greater energy than when they are put back on the old stand.

(NUMBER THREE.)

CHARLES SOLVESON.

IN working for extracted honey, the prevention of increase is easily accomplished by a judicious management in tiering up and extracting. But when we come to the production of comb honey, no system of management has as yet succeeded in absolutely preventing increase. There are, however, different methods of manipulation that tend to decrease swarming; but why try to entirely prevent swarming? Prevent it as far as is consistent with the largest amount of nice comb honey and then make use of the swarms *a la* Hutchinson and double up in the fall.

Of the different methods tending to prevent swarming, I will offer the following as being with me the most successful.

I use Heddon's sectional hive, but my system of management can be varied to suit the workings of any hive. We will imagine white clover in full bloom and a good colony of bees occupying two sections of the Heddon hive, with honey-board and one section case on, the latter being about half full of honey; now lift off the section case and one of the brood-cases, and from the case now remaining take four of the frames having the least amount of brood, crowding two to each side of the hive of the four remaining, and in the centre place four frames having a foundation starter half-an-inch wide, re-adjust your hive, and in about three days they will be ready for another case of sections, and as soon as the four frames below become filled with comb cut it out with the exception of half-an-inch for a starter, and replace them, making use of the comb removed to fill your sections. Thus by a judicious tiering of section-cases and the removal of the comb in the four above-mentioned frames when about three-fourths full, not more than 12 per cent. will swarm.

The four frames of brood and honey first removed can be tiered up on a few colonies, and will be filled with nice stores for winter.

THE BEE LOUSE OR QUEEN BEE TICK.

FROM "THE HONEY BEE" in the *Queenslander*, we gather the following:—

"We were sorry to be informed last week that the bee louse or queen bee tick has un-

doubtedly become established in the vicinity of Brisbane. Our informant expressed his thanks to Mr. Tyron for the information relative to this destructive parasite which he published in the *Queenslander* some few months ago. He stated that previous to this he—although a beekeeper of many years' standing—was quite ignorant of the matter. Latterly he has noticed one or two of his best colonies dwindle down to about half-a-pint of bees; the queens were still there but ceased to lay eggs. It struck him one day that the cause might be this parasite, so catching a queen he put her under a magnifying glass, and there sure enough were three of these ticks fast upon her. Holding the queen by the two wings doubled up over her back he removed them by the aid of a needle point. The little creatures hold very fast, and it is no easy job for a shortsighted person to remove them. Since their removal the queens have recovered their prolificness, and the colonies having been strengthened by additional brood combs are on a fair road to become strong. Our informant has since detected evident signs of this new plague among cottagers' bees that he has visited. So it behoves all beekeepers who find their colonies dwindling in an unaccountable manner to catch the queens and examine them. We shall be very pleased to publish any investigations upon the life history of this acarus from colonial observers."

We have not heard of this parasite in Australia (known as the *Brulla Caca*) outside of Queensland—it may be confined to that colony, or it may be it exists undetected among us. It will be well, therefore, to carefully examine the queens of colonies that fall off without any apparent cause, and it is quite possible that the presence of this parasite may be found to account for some of the otherwise inexplicable weakening down of our stocks.

A full account of this "queen tick," or parasite, will be found on page 125 of Vol. I. of the *Australian Beekeepers' Journal*.

DO BEES SELECT A HOME BEFORE SWARMING?

From the British Bee Journal.

WE have always regarded the statement, frequently made, that before leaving the apiary, if not before leaving the hive, bees have a new home selected if not fitted up, as a tradition that might, and again might not, have a basis of fact. We had an opportunity last week to see for ourselves, or rather to get our information from first hands, and under such circumstances that left no opportunity for mistake.

On Sunday Mr. Vance, the manager of our creamery farm, discovered bees clustered under the window-sill of his bed-room. There were but few of them, probably half-a-pint, and they seemed to go in and out of a very small crevice where the weather-boarding had

shrunk from the sill. He concluded this must be the traditional committee of investigation appointed by whatever power rules in the bee-hive, to find out whatever good lay before them and report. The committee stayed all Sunday forenoon, and spent the night and the next forenoon. The bees were Italians of a brighter and better color than any in our apiary, and hence were clearly strangers. The next afternoon, while Mr. Vance happened to be watching them, a large swarm of bees of the same color came in from the north-west and immediately began to cluster and enter the aperture in the siding. By prompt and efficient use of the smoker they were driven out, the hole closed and the bees clustered on a tree and were hived. We know of no bees of the quality nearer than nine miles to the north-west.

This seems to us a demonstration that bees select their home. This committee had evidently reported a land of promise near the alsike, white clover and linden, and had sent back a good report of the land as well as guides to bring on the colony. There seems to have been some misunderstanding, however, as about the same number of bees remained clustered on the spot after the swarm was hived, and remained there till Thursday, evidently supporting themselves by foraging in the fields till we took pity on them and allowed them to go to their chosen home.

The same day another investigating committee selected a similar place in a neighbour's house, and the next day one of his neighbours had a swarm of bees come off and leave. He followed them directly to the spot where the committee had all things in readiness.

What now is the governing supreme power in the beehive? It is certainly not the queen. She is simply the mother bee, and at the time the swarm leaves the hive may be but an infant of a day. Nor is it the drones, who are born to serve a brief purpose and then murdered. In the case mentioned there is a search for a location, the communication of intelligence to the parent colony, and uniformity of action on the part of the swarm. Now, who appoints this committee, and in what way is their report received and unanimously adopted and acted upon?

USE AND ABUSE OF UNFINISHED SECTIONS.

VALUABLE SUGGESTIONS ON HOW TO DISPOSE OF THEM.

From American Bee Journal.

IN the discussion of every question that is brought up in our bee journals, we have extremists whose advice it would not be wise to accept. Some say, "We have no business to have many unfinished sections, and with proper management there is no need of having

them." There will always be quantities of them as long as sections are used, since it is true, that by a sudden and unexpected ending of the honey-harvest by drought, or by too much rain, the flow is cut off, which circumstance can not be controlled by the beekeeper. This being true without a possible remedy, it is only necessary to deal with the problem of what shall be done with this uncompleted work. Some have advised burning the sections and melting the combs. Now this is bad advice, bad economy, and poor judgment. To make a fair living for a family out of the pursuit of apiculture (in most localities) it is wisdom to concede the fact that close, economical management must play an important part in the business. These partly filled sections are the best stock in trade about the apiary. When by actual experience I find that my bees will enter the sections more freely when they contain drawn combs, I want starters of comb, and I want them bad, say what you may about sections filled with foundation.

My first experience in the use of partly filled sections was not satisfactory; and especially was this so with those that had been pretty well filled out the previous season. The honey presented an oldish appearance, causing customers to ask, "Is this not old honey?"

I will now give my plan of working these unfinished sections up into cash. When the honey harvest is about closing, and work on sections is so slow that the loss is becoming greater from discoloration than is gained by completion, they are at once removed. Those completed are put in crates ready for market. Those almost finished are sold to any who may wish to buy them, at a little less price. What are not disposed of in this way are cut out, put in pans, filling in the interstices with extracted honey taken from the poorer finished sections. The pan and all is sold for about full price of nice sections, and no trouble to do it. The partly filled sections, after being nicely cleaned of wax and propolis, are run through the extractor, after which they are returned to cases as before, and stacked up in short tiers. These are placed over or near hives at night, to be cleaned up. They are then stored away in a mouse-proof place until the next season.

Previous to placing these again over the bees, the combs are reduced in thickness so that the depth of the cell is not over one-fourth of an inch. To do this nicely and speedily I got out a piece of sheet iron, smoothed on one side, and just large enough to easily go inside the sections. To the four corners of this are fastened small rods of iron, of a suitable length to permit a small lamp to go under the plate. A good heavy block of wood, having holes to receive the legs of this small table, makes all solid and a nice place for the lamp to rest. Now, by turning on or

off the flame, the plate is kept at such a degree of heat that the comb is quickly melted away to the desired thickness. They are now placed in the cases, and when the surplus room is needed by the bees, these sections are given to the strongest colonies, and at once they go to work on them. After the bees have worked on these combs a few days, I examined all other colonies; and where any are found slow about starting, I take four or five of these sections, bees and all, and place them in the centre of the case, which will usually start them at once; but if any colony, for lack of bees or other cause, still refuse to go to work, I exchange a full case, which never fails.

By melting away part of the length of the cells, the bees are compelled to add new wax in lengthening them out, which, when finished, will be as fine in texture as though no old comb had been used. If the honey taken from the unfinished sections is not ripe enough to be nice, it must be placed in open vessels in a dry, warm, airy place, where it soon become "orthodox" honey. Some will advise giving the unfinished sections to light colonies. As long as I can get ten to fifteen cents for this honey, and granulated-sugar syrup for five cents a pound, the latter will be used to supply colonies deficient in stores.

J. A. BUCHANAN.

Holliday's Cove, W. Va., Nov. 21, 1887.

Inquirers' Column.

AMERICAN BEE JOURNAL.—What is the annual subscription for the *American Bee Journal*, including postage to Australia?—G. GREEN.

The annual subscription of this excellent journal is only one dollar (1s.) per annum, in America. The postage, if sent monthly via San Francisco, will be about 3s. per annum extra. It could, we believe, be obtained weekly, if desired, through George Neighbour and Sons, 149 Regent Street, London.—Ed.

ROOT'S 10 INCH ROLLER FOUNDATION MACHINES.—A subscriber enquires if these can be obtained in Australia, and their cost?

We find the cost to be about £6 or £7 for the latest patterns. They can be obtained in Melbourne, Adelaide, or New Zealand, see advertisements.—Ed.

MEAD.—Mr. J. Thacker, Lillimur South, asks us to give a receipt for mead. We give a short paragraph on this subject in another page of the present number.

A VIRGIN QUEEN may be removed from a colony of bees and a fertile queen introduced immediately, provided smoke is used in the operation.

A QUEENSLAND APIARY.—When travelling among the Redbank Plains farms—writes our Agricultural Reporter—I discovered an apiary of which I had not previously heard. It is called the Melbonum Apiary (freely translated, Good Honey Apiary). It is run by Mr. James Jones, a young man, the son of one of the oldest farmers of the plains. It is pleasant to find that he is well acquainted with all the modern discoveries that make beekeeping a science. He has only been interested in the matter for the past three years, but he has built up an apiary of over sixty hives, the queens of which he is fast turning into Italians from pure blood obtained from Mr. R. Cribb's bee farm. I noticed the extractor, foundation machine, bar-frames, and all the numerous sundries of the modern beekeeper. The colonies looked to be most of them strong, and were busily at work. The honey is sold locally and to Ipswich residents. It is marketed both in sections and in glass jars. At first I thought the locality a bad one for honey gathering, for it is some distance from the forest trees, but I was told the bees were gathering honey from somewhere. Knowing that it could not be from forest trees, as there are none of them in flower I looked keenly about, and at last found that the bees were working upon the wild mint, which is a weed now taking possession of the cultivated fields to the detriment of the butter and milk produced from cows that graze upon it; also I noticed them very busy upon a pink-colored pea-like flower of another common weed locally known as *wild indigo*; the honey from this latter plant I should judge to be very good. It is thus evident that the beekeeper upon open cultivated downs may sometimes be better situated than his neighbor among the ti-tree and eucalypts. Another point is self-evident—namely, that the farmer who thinks he can by keeping bees upon the old-fashioned box-hive system compete with the apiarist who works with the modern appliances and gives care and thought to his business will, now that the honey market is overstocked, be woefully disappointed.—From *Queenslander*.

SOUTH AUSTRALIAN BEE NEWS.—So far the season has not been a very good one for apiarists, although the profusion of flowers on some varieties of gum trees promised well. In our own locality the flowers do not appear to secrete as much honey as they did formerly, and this may possibly be explained by the fact that the district is getting over-stocked with bees. Many beekeepers maintain that in most parts of South Australia over-stocking is almost an impossibility during the honey season, but we do not hold with this, and are decidedly of opinion that in the country immediately around Adelaide there are too many hives of bees for all to give a good return.—From *Garden and Field* for February.

FEEDERS.—I want to suggest another idea to N. L. Gerish or C. C. Miller, in regard to filling empty combs with syrup. Instead of using the machinery that friend Miller describes, I take an empty comb (those that are in wired L. frames are the best to handle) and immerse it with the flat side up, into a wash-boiler half full of syrup, or more, pushing the comb down with one hand until the syrup flows over it, and then pass the other hand back and forth over the comb, lightly touching it. This will suck the air out of the cells, causing the syrup to take its place, until the whole side is filled or rubbed in; then reverse, and fill the other side in the same way. After they are filled, place them in a comb-bucket, to drain off. You might, before you set them aside to drip, wipe off with your fingers some of the surplus. After you have a sufficient number, take them to the hive, and the bees will repack them. You want your syrup about blood warm, and thick. I make mine like friend Heddon, using 3-lbs. of water with 10-lbs. of sugar, adding one level teaspoonful of tartaric acid when boiling. I know, friend Root, that you object to using any acid; but have you known of any harm that has resulted from it? If not, why not use it, as it will keep syrup from sugaring again? When I don't use it I find the sugar all crusted on to the combs after filling the combs in this way.

A COLONY OF QUEENS.—One of our stocks, headed by a queen, the daughter of a Cyprian, mated with an Italian Drone, swarmed in January. On opening the hive six days after six young queens just hatched were caught among the frames, and twenty-four queen-cells were cut out, five of which hatched the same evening. This is the breed for queen-rearing, as the bees are very gentle and the queens prolific.—Ed.

A VIRGIN QUEEN two days old cannot be introduced to a colony of bees unless the colony has been queenless three or more days.

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THE

Australian Beekeepers' JOURNAL.

VOL. II.—No. 11.]

APRIL, MAY.

[PRICE 6D.

Editorial.

HINTS FOR MAY AND JUNE.

It is now quite late enough to make the final examination of our stocks for the season. Choose a fine, warm morning when the bees are flying briskly, and open your hives.

1. Examine the frames first to see if there is brood of all ages; if so, look carefully for any signs of foul brood. If you see covered cells scattered irregularly over the comb while the remainder of the cells are empty it should at once arouse suspicion, more especially if some of the cappings appear sunken and have tiny holes like pin holes through them. In such a case take a little splinter of wood, or a pointed stick, and open out a cell. If it contains the viscid brown matter of a grub putrefying, there can be little doubt of the presence of foul brood. At this time of year the disease is not likely to progress much, at the same time it is not likely the bees will prosper. We recommend, however, that all combs badly affected be removed from the hive, and the bees crowded on to as few combs as possible, at the same time feeding them freely with plain syrup. We have come to the conclusion that *physicing bees* with phenol, salicylic acid, &c., does more harm than good so long as they get plenty of wholesome food in a clean, well-ventilated hive. The best course to pursue, if one has empty combs from healthy hives, is to get a new hive and place four or five empty combs in it. Remove the diseased hive, and put the new one with empty combs in its place. Take the diseased hive some distance away, and shake and brush all the bees from the frames on to a sheet, on which any kind of clean box has been placed, with one end propped up, for the bees to cluster in. Towards evening shake the bees out of this box into the new hive, and feed them freely

for two or three weeks. If no empty combs are obtainable, all we can do is to remove the diseased combs, and feed freely till Spring-time comes, when the bees should be put into a new hive with new frames with starters of foundation as soon as breeding commences, for the weather will be too cold for much comb building till September or October.

2. If there is no brood or eggs a careful search for the queen should be made, for it is quite possible the stock may be queenless, and unless supplied with a queen at once will be utterly valueless by the Spring. If no spare queens are obtainable, the proper course will be to unite the stock with another having a queen, as soon as possible.

3. If there be brood of all ages visible we may safely conclude the queen is present, but it is always more satisfactory to sight her if possible.

4. Carefully examine the amount of stores in the combs, and if there is not at least ten pounds of honey for every five frames of bees, ten pounds of good, thick syrup (made as directed on page 148, No. 10) should be given them as fast as they will take it away.

5. Lift the body of the hive from the bottom board, and clean away all dirt and rubbish that may be found on it.

6. Replace all old and worn mats by new ones, and it will be none the worse to put a second mat over each stock.

7. Entrances should be left not less than four inches wide for full stocks, as free ventilation is as important in Winter as in Summer.

Where any planting or sowing is done for bee food near home, it should be done not later than May. Sunflower, borage, *phacelia*, all the kinds of clover and lucerne, *echium candicans*, cornflower, &c., may be sown and any plants from self-sown seeds planted out for early flowering.

HIVES.

Continued from page 150.

If any enterprising apiarist would undertake to obtain a specimen of every frame-hive now in use in Europe, America and Australia, and report a year hence on their relative merits he would, I believe, sum up that report by a statement that hives are not so important a factor in beekeeping as intelligent management, and that with good management good returns can be got from any form of hive when honey is plenty. For all this there is something to be said about some of the new kinds of frame-hives.

Beekeepers are yet a long way from agreeing as to the best size of frames even in the same localities; it is not to be wondered at, therefore, that different sizes and forms are advocated in different countries. And this is perfectly right we think, for the duration and intensity of the honey seasons are important matters when considering the size of frames—and these are very different in different countries. How different are the conditions of Queensland for instance and the south of New Zealand. The former with its almost perennial honey-flow, and the latter with its liberal but comparatively short harvest. Still for both these localities the Langstroth frame appears to be suitable, and is widely adopted.

The new hives that have attracted most attention are those known as the "Heddon" and as the "Simmins' Non-Swarming Hive." The former is the outcome of a supposed advantage in reversing frames (turning them upside down) soon after the honey-flow commences. In its most recent form it consists of two or more boxes half the depth of the Langstroth, with shallow frames to correspond; only eight instead of ten frames are put in these boxes, the frames being the full length of the box and close-ended; they can be made fast in the boxes by tightening screws at the sides, so that box and frames can be lifted, handled and turned over in one solid piece.

Some time ago a new hobby was started or reversing frames, in the first place to induce bees to fill the frames with comb, for in the ordinary way the combs are seldom built down and attached to the bottom, and when they are there is no doubt they are much stronger and better for extracting and handling, as well as safer from collapse in very hot weather. In the second place by reversing we put all the honey at bottom instead of the top of the frames, and as the bees would at once begin to move this higher up it was stated that by reversing and putting on supers with section-boxes or frames the bees would at once clear out the brood combs and move the honey to the supers, leaving plenty of room for the queen to lay, and thus get the stock into the exact state one wants it to be at the commencement of a good honey-flow. Mr.

Heddon subsequently found that if the brood-box was divided horizontally into two parts, and instead of reversing the frames, the top and bottom halves of the hive be changed, the same object could be obtained with greater convenience.

We have tried the Heddon hives this season, and our experience is as follows:—Two new swarms were put into two hives in October; the bees rapidly filled up the frames with comb, brood and honey; as soon as ever the top combs were widened for honey storage we exchanged the half-boxes by putting the top one at the bottom, and put on the super with section-boxes. The bees took the honey up to the sections at once, but before sealing them the bees swarmed. In looking for queen-cells to cut them out we found some little difficulty in finding them all; much more than in the ordinary single frames, and in one case we had to take out the frames one by one for this purpose, and in replacing them it was almost impossible to avoid crushing bees on the tin ledges at the bottom of the box on which the frames rest. After swarming was over the bees got to work at the sections again, when a second tier was put on under the first one, all of which were rapidly filled. These hives are very convenient for working for comb-honey and handy to manipulate, but we do not find them so satisfactory generally as the simple Langstroth frame. We find it very difficult to find the queen, and although we have sometimes found her on the bottom board after smoking the bees well from the top, it has more often been necessary to loosen the frames and examine them one by one. All things considered, we prefer the loose Langstroth frame for our management; and we believe the Heddon hive will not make much way among beekeepers.

The "Simmins' Non-Swarming Hive" is of quite a different form, and it is difficult to describe it without drawings. The principle is as follows:—According to Mr. Simmins, bees will have no desire to swarm so long as they always have room for comb-building between the brood nest and the entrance. He provides this condition by placing the frames parallel with the back and front of the hive, keeping the bees and brood frames at the back with a division board, until more room is required, and then removing division board and filling the vacant space between entrance and the brood frames with fresh frames with narrow strips of foundation for starters only. As the bees fill in these frames with comb they are removed and other frames with starters put in their place, so that the bees are always kept comb-building in front of the hive, and the combs thus built are either put over the brood nest at the back of the hive for storage of honey for extracting, or are cut up to fill sections to be placed in a similar position for comb-honey. Mr. Simmins claims for this system

that it always reduces swarming to a minimum, and often prevents it altogether, with a corresponding increase in honey storage; that bees will go more quickly into the supers, and work more persistently and contentedly.

(To be continued.)

Proceedings of Beekeepers' Associations.

THE monthly meeting of the S.A. Beekeepers' Association was held at the Chamber of Manufactures on Friday evening, 6th April. There was a good attendance, and Dr. Cockburn, M.P. (President), was in the chair. Mr. H. Warren, a representative of the Williamstown Association, was present. The principal topic discussed was that of foul brood in bees. Mr. Warren expressed his disbelief as to the existence of the disease. In stating his disapproval of the Bill passed in order to assist beekeepers in extinguishing foul brood, he objected to the way in which the Act was likely to be administered. He thought that the Commissioner of Crown Lands was not fitted to administer the Act, as he was quite incapable of understanding the question. He had a great horror of "Inspectors," and he would like to point out to beekeepers the danger of these Inspectors disturbing bees in the middle of winter, in order to see that the hives were healthy. He was certain that the majority of beekeepers would object to having an Inspector prowling about, and rather than submit to the nuisance they would part with their bees. If the matter were placed in the hands of local authorities the result would be satisfactory to all parties. The Chairman pointed out that an Inspector would have to exercise an intelligent judgment in doing his work. It was not likely that such a disease had no existence when many scientific and practical men all over the world had identified it as a bacillus, and pronounced it to be a deadly one. The Secretary (Mr. Joyner) referred to journals which stated that the beekeeping industry in England was imperilled, and the disease was spreading in America. Nearly every beekeeping journal of England and America was crying out against the ravage. He was prepared to prove that the foul brood existed in the colony, and was infectious. Mr. Warren said that he placed little trust in the statements of those journals. It was quite likely that the complaints emanated from beekeepers, who, being disappointed at their own failures, were vexed at the successes of their neighbours. He regretted that the Act was passed before the people in the country had had an opportunity of learning what its objects were, and they were determined to do all in their power to prevent it from being put into force. In con-

cluding the discussion the Chairman expressed the hope that the mutual efforts of the Adelaide and Williamstown Associations would tend to the best interests of beekeeping. —*S. A. Register.*

THE usual monthly meeting of the Queensland Beekeepers' Association was held on Monday, Mr. J. B. L. Isambert, M.L.A., in the chair. A letter was received from the South Australian Beekeepers' Association, with a copy of the Foul Brood Act and also the pamphlet issued by the Association on the cure of foul brood. The secretary was instructed to write to the Under Secretary for Agriculture bringing the matter under his notice. Mr. Trowe, one of the members, stated to the meeting that he had lately observed bees collecting a substance similar to honey from the under side of leaves of the English elm. Mr. R. J. Cribb read his promised paper on co-operation in the sale of honey. By means of combination in this direction a fixed price might be set for honey, and the producer could send his honey to market at that price, leaving others to sell it while he stayed at home and looked after his bees. The advantages likely to arise from the plan suggested were dwelt upon at some length, and at the close of the paper a discussion took place. —*Queenslander*, March 27, 1888.

News and Reports from Colonial Apiaries.

BACCHUS MARSH DISTRICT.

MR. L. J. CHAMBERS gives us a good account of Bacchus Marsh as a bee district. He says (writing in February): "It is a grand spot for bees; Lucerne growing everywhere, and flowering always; but what surprised me most was to see box trees (*Eucalyptus Melliodora*) now coming into blossom. Two species, one showing a reddish color on the bark and twigs, the other white, and like the yellow box of the North-East. Now, I am informed that the red and yellow box of Gippsland and the North-East flowers in December and January, so I am curious how nearly allied these two species are, and by what they differ in other respects. I lifted up a box of bees weighing about 50 or 60 lbs., and found this was a swarm that had been working five weeks only." Writing on the same subject on April 13th, he says: "It would gladden the sight of any beekeeper to see the flow of honey now on in the Bacchus Marsh district: the box trees white with blossom for miles. I sent up a few hives at Easter, with instructions for transferring, which being done, the new hives were filled in the body in four or five days, and supers put on, and now everything is a solid mass of white comb."

HUNTER RIVER DISTRICT.

A correspondent writes: "This is a great honey season in this (the Hunter River) district, at least, so far as the bush is concerned, there has scarcely, if ever, been a better. As an instance, I will give Mr. Vogel's experience at Paterson. He started this season with two good colonies, three fair ones, and twelve others, little better than *nuclei*, which he had to build up. He has now increased to about 70 colonies, and nearly a month ago (early in March) had extracted about 5000-lbs. of honey, and had had 700 sections filled. Others have had a similar experience; and as the honey-flow appears as if it will last throughout the Winter, a lot more honey is expected.

SINGLE DAHLIAS—EUCALYPTUS OBLIQUA.

A contributor informs us that bees are literally swarming on his single dahlias. These flowers furnish abundance of pollen, and probably some honey. From the same gentleman we learn that the *Eucalyptus Obliqua* is a grand bee tree, for he saw these gums in bloom on the Pyreuses, and actually alive with bees. The Eucalypts in the Northern and Western districts are flowering freely this month (April), and should the weather continue warm will yield abundance of late honey.

must have killed the queen in so doing, as I could not find her. I then placed them out in the garden, but, *facilis descensus*, they began to dwindle away, when after about 10 days (surprise No. 2) a new swarm in the hive, overcrowding the division board, and on friendly terms with those they had annexed themselves to. Now, how do you diagnose the case? Where was the Queen in the first instance? I feel sure she was amongst those I shook into the frames.

The bees are storing fast just now, principally from the peppermint gum (*E. Amygdalum*), they are very thick too on the ivy, also fallen pears, &c. We have any amount of thistle (*carduus*) in the Summer. In January I found the pyramid tree (*Fugosia Pattersonii*) splendid bee forage, and of course sunflowers in January and February.

The cold weather lately kept the bees at home a good deal, but they have given me nearly seventy sections already.

"So work the honey bees,
Creatures that by a ruling nature teach
The art of order to a peopled kingdom."
—Shakespeare.

Yours truly,

NANGULA.

THE NECESSARY CAPITAL REQUIRED TO START AN APIARY OF FIFTY HIVES.

No. 58.—Given a good locality and some previous experience of beekeeping under modern rules, what amount of capital is required to commence beekeeping, with the hope of an immediate return for labor and investment? Leaving out the question of house residence, which may be computed as a debit against net profit, in the shape of rent, as personal expenses, I will deal with the necessities of the bee-yard only.

The value of the bees, either in possession, or to be purchased, may be stated in either of two ways—either as 50 swarms, or a less quantity, computed to increase to 50 in spring. For convenience, the former may be stated.

A good swarm of bees may generally be considered value for 10s., therefore, 50 for £25; necessary hives for 50 at 10s., £25; extractors, section-boxes, smokers and sundries, £10; incidental expenses, £10; comb foundation, £5. But as it is necessary to have spare hives, supering arrangements, and all necessary appliances for marketing honey, fully another £25 will be required before any return may be expected, or at least should be available. This brings up a capital expenditure of £100, as representing the first year's requirements.

With a moderate yield of honey, a ton will probably be taken—the Apiarist having an eye to increase of stock following season to 100. Valuing this honey on the spot at £40, this sum will represent profit on labor for the year.

The following spring requires say 60 more hives, £30; comb foundation, £10; supering, £10 sundries, £10. Total, £60. Against which may

Correspondence.

No. 57.—Early last Spring a friend kindly lent me one of Root's works to study, and so "put a bee in my bonnet," and having nine box hives I went in for the Langstroth's, increased to 24 during the season (11 of which have supers on), besides a hive of Italians, the nucleus of which I got from Mr. Chambers, of Franklin Street. All are doing splendidly, but the progeny of the Italians are sure to be very much hybridised, as the trees contain any number of Black swarms; that grand preceptress, "Dame Nature," thus teaching us that this Casterton neighborhood is a grand one for bees.

Now, for my first experience in putting a swarm into a frame hive:

Having drummed the bees into an empty box, and shaken them amongst the frames, I took the full one, in which very few odd bees were left, and put it in an empty store room above the kitchen, against the flue, for warmth, so as to hatch out the young brood (I got the wrinkle from either Root or Cook), which would then be added to the original stock. Judge to my surprise when two days after I found the whole swarm in their old box, and the frame hive empty. The windows had, of course, been left full open, and the distance from the hive to the kitchen is fully 300 yards. Not to be beaten I transferred putting the brood into the frames, but

be placed, say four tons extracted honey, £160—and, say 30 doz. sections, £12. Total, £172. So that the account would show a cash balance of £52 at the end of the second year, but the value of stock and appliances on hand being equal to £250.

Now, in this business, as in almost all others, the beekeeper may hold in at this, and need not increase to any extent, or may sell part increase to pay for having other part retained. Of course, if it is deemed necessary to still work for increase of stock, the profit may be so appropriated, but otherwise, with two or three seasons experience of the district in which he lives, and its resources, a system of non-swarming may be practised, by the constant use of the extractor, or other measures. We may safely say that the matter of further outlay of any consequence is now at an end, or is met equally by sundry sales. The capital account may be fairly stated at value £300, and the yearly returns for labor, &c., £100 to £150, according to season, with most likely a blank thrown in occasionally, so that if we estimate £100 per year we shall be somewhere near the mark. Now comes the question of labor. Supposing 100 stocks to be the limit of one person's ability to manipulate, he will require constant attendance for at least six months of the year, and a good deal of necessary preparation made during the winter evenings, otherwise he will be free to devote the remaining six months to any other pursuits his genius prompts. Now, I don't think this is overstated, and fairly represents what one person may accomplish, having a good locality, £100 cash, available time, and common sense to back it all up, and while the work in part may be hard, he will have the satisfaction of enjoying a feeling of independence and self-reliance, and keep his liver plumb.

Yours, L. T. CHAMBERS.

No. 59.—I have been carefully going over the figures given at page 149, under the heading of "Hives," and note what you say of the difficulty of giving a satisfactory answer to the question, "Wherein is a frame hive superior to a box hive?" and it appears to me that there are so many contingencies that any arrangement of figures can be of little value. As you state the case you would start the two beekeepers on very unequal terms—the one with the frame hives plus a good amount of experience, which must be purchased in some market—the owner of the box hive minus any knowledge of bee-keeping.

No one can use the extractor, run also for section-honey, cut queen-cells, and manipulate generally without some previous experience, which *has cost money*, and therefore is part capital.

The return stated might be obtained on a good flow of honey without a very large amount of knowledge, but in that case the box man, if he knew anything about his business, would not be far behind. I am often met with the question as stated, and have always thought it wiser to abstain from giving comparative figures.

Your article should, in this case, I think, be headed "Extractor," for therein lies the strength of the return. For beginners will see their way clear to spend 50s. on an extractor and knife; but if prepared to go so far have still to learn its management. I know that when that is understood the increased honey return is equal to about 3 to 1, and the probabilities of swarming lessened by its use; but this experience must be *bought*. In answer to the question I should simply say that, to the beginner, the frame hive offers (1st) the opportunity of becoming acquainted with what transpires inside the hive; (2nd) the possibility of controlling and directing the work of the bees, and (3rd) the means of securing honey with less trouble and in better shape; but, if I proposed to show a profit and loss account of the average beginner who really means business, and has a few pounds to spare, I would state it somewhere like this, as a first year's result:

Dr.

To Bee Guide or Text Book	...	£0	7	6
Subscription to Journal	...	0	6	0
Five Frame Hives	...	2	10	0
Comb Foundation	...	0	10	0
Supering and Sections	...	1	0	0
Extractor, &c.	...	2	10	0
Sundry Experiments	...	1	0	0
		£8	3	6

Cr.

By 100-lbs. Honey at 6d.	...	£2	10	0
1-doz. Medium Sections at 10s.	...	0	10	0
Balance	...	£5	3	6

But his experience being worth fully £10 to him, although not a transferable asset, he is prepared to start in next season with appliances and experience, to credit and to gain more year by year until they began to crystallise into gold coin.

Do not let anyone be misled by any statement that the frame hive is so much superior in the matter of yields; but emphasize the fact that apiculture is a business to be learned by constant application, and often attended by severe trials and losses.—Yours,

L. T. CHAMBERS.

Corinella Apiary, 17th April 1888.

Original Contributions.

PREPARATIONS FOR WINTERING THE BEES.

In cold climates the good wintering of the bees is looked upon as a masterpiece in apiculture. The Australian climate is not severe, and what applies in cold countries in regard of protecting the bees from too severe a cold, is not required here; nevertheless, the result to next year depends a great deal on the wintering, and the beekeeper should do all in his power to provide

them accordingly. The honey season closes generally in April, and the beekeeper must make the most profitable use of it, at the same time considering the best way for wintering his bees. As worker bees require three weeks for their development, and when hatched a few days care, all young bees reared in the last four weeks neither gather honey nor help to work inside the hive, they are valuable for wintering only. Not only that, but this late brood helps to consume a good deal of honey, and requires to be cared for and fed by other bees, and the cells used for breeding can not be used for storing honey. Italian bees decrease their brood before the end of the honey season, and fill the cells with honey. With them it happens sometimes that they thus become weak. For these reasons the beekeeper must prepare his bees for winter before the end of the season. Weak hives can be strengthened by giving them a comb of brood from a strong hive, or two weak ones can be united, first having removed one queen, and then rendered the bees defenceless by smoke. After a sudden close of the honey season the entrances must be made small, especially in fine weather, as the bees are then inclined to rob. Old, or otherwise valueless queens, must be exchanged, and the combs should not be too old, and should contain sufficient honey and pollen to last till spring, when fresh can be gathered, or feeding can be done without risk. Should a hive want supply of honey, and none could be given in the comb, such a hive should be fed at once till enough is stored for winter. The queen is of principal value, and no queen of bad quality should be taken into winter quarters, as the strength and activity of the stock in next year depends on the queen entirely. Now is a splendid time to destroy Black Queens and replace them with pure Italians. After these preparations it is easy to winter them properly, and the sooner that is done the better. In short, the foundation of the good wintering of the bees is:

1. A young, fertile and healthy queen.
2. Bees enough to cover at least five frames.
3. From 10 to 20-lbs. of good honey, and some pollen.
4. Nice workercomb, not dark and defective.
5. A good hive.

If these points are satisfactory, there is every hope of a good result at the end of the winter season. In districts with severe winter and late spring, the hive must be made of heavier material, and an extra few pounds of honey must be left for food. But as most parts of Australia have a mild winter, strong colonies should not be wintered too warm, as the bees may commence too early to breed, and consume more honey, which induces them to untimely flights. Disturbing the bees in their winter rest may have bad consequences on them, and feeding them should absolutely be avoided. They should not be disturbed without need.

A late winter is most dangerous for the bees, as it causes thirst, impure air, etc., which makes them suffer, and brings a severe loss. The bee-

keeper has to avoid this. The bees want water during their winter's rest, especially when they commence breeding; but sufficient of this is generally produced above and on the sides of the bee nest through the warmth extending therefrom meeting with the cold air from outside. If the cover of the hive lets the warmth escape, as is often the case with hives that open at the top, the bees will suffer for it; on the other hand, when a hive opens at the back, there is a ventilation throughout to a certain extent, and the damp air forms waterdrops on the top inside which the bees take, if required; and if not, it runs down, and the circulating air takes it up again.

Having the bees wintered on the above conditions they will winter well. I may here state that since my career in beekeeping, I have yearly wintered several hundred hives, but never lost one. A few queens die every year, although they may be young. I have always found it a great advantage for successful wintering to be able to decrease the space for the bees during that period, and with my hives it can easily be effected. I take every comb out at the last revision, and examine its contents, as well as the number of bees thereon—the quality of the queen being noted long before—then the hive is cleaned of every obstacle that hinders manipulations; five to eight selected combs most suitable for next year brood, with the required quantity and quality of honey, and some pollen, are returned, placing the glass division close to the last frame. Thus, an empty space for two to five frames between glass and door is left, the honey room above being empty, also with its openings covered. Now I have it in my power to regulate the circulation of air; in short, winter them cold or warm, as desired. In mild weather, and with strong hives, the small slips of wood at top and bottom of the glass division are left open, even the communication to the honey room may be left open, thus giving room for circulation of air; but with weak hives, and in cold weather these openings are all closed; the honey room, and also the empty space between door and glass is filled with hay, to keep the warmth the bees produce together. How soon the number of bees in these hives, although weak in the autumn, increase in spring, those only are able to understand who have tried it, and the consumption of honey is only a trifle.

It surprises me that American beekeepers, with their highly-priced hives, suffer so much through loss of colonies dying during winter, or in early spring. An expert in beekeeping should not lose two per cent., whether in cold or mild climate, and let it be understood that I have wintered bees in North of Europe as successfully as here, although we have had snow and ice for five months some years, and our bees were confined without a flight for all that time. The hive has proving this.

W. ABRAM, MANAGER,
Italian Bee Company.

Parramatta, N.S.W.

Extracts from Foreign Journals.

ROBBER BEES AND ODORS.

At this time of the year it takes very little to induce bees to start robbing each other's hives, and the apiarist is often put to his wits' end to stop the thieving. The following is the experience upon this point as related by "A Country Parson" in the *Country Gentleman*:—"Twenty-five years ago I began beekeeping with a row of hives, all painted alike, and placed close together, say 12-in. apart. This likeness and nearness of hives, together with my work and fussing, soon brought on the calamity—robbing right and left, stealing, fighting, and killing, until some of the hives were empty, and the ground covered with dead bees. I rushed to my library, and then tried the plans described as infallible remedies. Tied them up in sheets; deluged them with water; buried them in loose straw; smashed the robbers' combs; put them to sleep with chloroform; shifted positions of hives. But they still fought and robbed and killed like little demons.

Then I sat down to study out a remedy, or to see the end of this Kilkenny-cat process. I soon found the difficulty to be in this—that the robbed bees could not distinguish between the friends in their own family and their enemies from other families. I could tell which were robbers from their hesitating flight about the mouth of the doomed hive. The home bees came in like an arrow from a bow. The robbers hesitated, backed and filled, and seemed watching for a chance to get in. But of this sign the home guard seemed to take no notice. From this I concluded that they did not discriminate by sight.

In this way I went on to eliminate the different senses from their method of discrimination, until at last I reached the conclusion that the sense of smell was their chief, if not their only, dependence. Any observant beekeeper has found many evidences that this early conclusion was sound. (I should like to ask here whether there is any honey-producing blossom that is destitute of odor? And, by the way, one of the best plans for introducing queens is to give the strange queen and the swarm the same odor. And so in all processes requiring the union of bees from different swarms.

But to return to our robbers. The guards are on duty at the entrance of the hive. The robber lands on the lighting-board. He either steals in unobserved, or is challenged. If he has been in the hive often enough to have acquired the right odor, he is admitted as a friend. If the scent is not clear he is doubted, and there is hesitation. If he brings a brand new and strange odor, he is "bounced," and a fight begins that generally ends in the death of the bouncer or bounced.

This suggested the remedy. I took some musk, wrapped it loosely in muslin and covered the package with wire netting, for fear the bees might eat it and get poisoned, or tear it to pieces and carry it out of the hive. This little package, about 1-in. long and $\frac{1}{4}$ -in. in diameter, I dropped in the midst of the combs of the robbed hive.

The next step was to get a contrasting and strong odor for the robber hive. I selected essence of peppermint, diluted 1-oz. of it with a pint of milk-warm water, borrowed my wife's indoor plant sprinkler, uncovered the robbing hives, and gave them a dash of the perfumery.

It isn't easy to laugh alone, but I did laugh out loud and long when I saw the result. The musk guards waited in alert expectancy. A peppermint robber began to buzz around, but the musk fellow detected his presence and followed every motion of the peppermint adversary, by turning his belligerent front, when the robber was at least 12-in. distant. And when he would venture within 2-in. or 3-in. of the vigilant musker, the guard would fairly leap at him and catch him "on the wing." There was no room for fight and no killing. The alien peppermint robber would flee with the cowardice of his profession.

It is no exaggeration to say that within five minutes the whole thing was stopped, and for good. The remedy is effective, and can be applied with little trouble, and not more than two minutes of time.—*Queenslander*, March 24, 1888.

HONEY FROM EUCALYPTUS GLOBULUS.

A SPECIMEN has been sent from Adelaide, S. Australia, to Mr. T. Christy, of London, as possessing similar properties to those of the tree itself, being, for example, antiseptic in its nature. It is found to be very efficacious in cases of lung disease. The honey can only be procured every other year, as the tree flowers biennially. One peculiarity is that, though liquid on arrival, it rapidly crystallizes in this climate. It has a very peculiar flavor and scent.—*Gardeners' Chronicle*, Feb. 25, 1888.

ALFALFA OR LUCERNE.

From the *American Bee Journal*.

A CORRESPONDENT wants us to answer the following question about alfalfa or lucerne:—"What is the best time of the year for sowing it? How much seed is required to the acre? What soil does it require? How many pounds are there in a bushel?"

In reply we would say that lucerne or alfalfa (*Medicago sativa*) was introduced into the Pacific States from Chili, many years ago. It resists the driest weather, and it is said that when every blade of grass droops for want of moisture, it holds up fresh and green.

The hay is valuable for cattle, but as it is cut for this purpose early, that lessens its value for honey.

The seed should be scattered plentifully in the winter months, so that it may settle into the soil with the spring rains and germinate. It will grow on any soil; there are 60 pounds to the bushel, and 25 pounds to the acre will be sufficient. It is said that this valuable grass was brought into Greece from Persia nearly five hundred years before the Christian era. It came to California from Chili, but it is now largely cultivated in England, France, and other parts of Europe, and gives great satisfaction as a forage plant.

Alfalfa will be a prominent crop in all places where the winters are not too severe. The power to withstand great heat and dryness comes from the long, searching tap-roots, which are sent deeply down in the soil and find moisture which is inaccessible to other less energetic plants.

MR. SIMMINS' NEW BEE BOOK.

(From Canadian Bee Journal.)

"A MODERN BEE FARM, and its Economic Management," is the title of the latest addition to beekeepers' literature, and is written by Mr. Samuel Simmins, an extensive English honey-producer and queen-breeder. Many of us have his valuable pamphlet (before mentioned in these columns), and those who found that a treat will not be disappointed in this his latest production.

As the title implies, he tells us what he does and how he does it in the great Sussex apiaries, and it seems to me that beekeepers must be few who cannot find something new as well as interesting in the book.

The author tells us in the preface that practical beekeeping is his subject, and that with few exceptions the instructions given are based upon the writer's twenty years' experience in the apiary. That he has learned more by his failures than by his successes, as in the endeavor to overcome his difficulties he has brought out his most important methods of management. He believes the man who can give the subject close study and application, and finds himself adapted to the undertaking, may safely invest his money, and receive better returns than from many other occupations of the present day.

The book is not in any sense an encyclopædia of modern bee-knowledge; the author simply gives the methods found to be most economical and practical.

Under "Bee-Culture as a Profession," beginners are advised to first serve a couple of years in some well-established apiary, instead of keeping a few colonies and gradually increasing the number. Time and money will be saved, better plans formed, and success will be more certain. The amount of capital required is considered, and the various expenses

estimated. Five hundred pounds, or about 2,500 dollars is considered necessary to properly commence the business with 100 colonies.

Much valuable advice is given on the sale of bees and queens, and under the manufacture of appliances beginners especially are advised to steer clear of the business of selling supplies. In the economy of the hive, the suppression of drone-production is a step toward the prevention of swarming.

The chapter on "The Varieties of Bees," is equal to anything I have seen on the subject. Blacks or Natives are highly valued because they are well adapted to the production of comb-honey; and when the beekeeper has all the colonies he requires, no objection can be made to the sole use of this race when comb-honey alone is sought for, although he mentions further on that pure Blacks cease storing quite a month sooner, and are frequently troubled with wax-moths, while the foreign varieties never are.

It is claimed that Blacks have great conservative energy; that the young commence work outside at a much earlier age, and a given number will produce and maintain a much larger amount of heat than the same number of any other race. That here is the sole reason why these bees are always ready to take to the supers, and are better comb-builders than others, though they may be occupying the same space with less than half the population. That here we have the best material for an improved strain of bees; and that by the admixture of foreign blood we may get greater laying-powers in the queen, a better disposition in bees, and eradicate the inclination to cease storing honey toward the close of the season, while it is yet to be gathered.

He advocates breeding from Black Queens crossed with Carniolan or Yellow Drones, Cyprians preferred to Italians. Black or Syrian Drones should be vigorously excluded. He says that Italians store honey and draw out foundation later in the season than Natives, as well as gather more honey; also they are more gentle, but their comb-honey is not quite so good, and they are not as good comb-builders, are slow to enter supers, and quite useless for queen-rearing purposes. That Carniolans, of all pure races, are the best "all-purpose bees," although not quite equal to the Cyprians as honey-gatherers; are the most gentle of all, and best for beginners. He thinks they were at one time a cross between the Cyprians and Germans, and the color reverted back to that of the majority. That Cyprians are destined to take the lead among the yellow races; though not suitable for the production of comb-honey, they are very active honey-gatherers, of great beauty, and (with him) extremely docile. Their body is smaller than the native variety, and unlike the Italian workers, opens to a fine point.

In chapter 6, "How to Obtain Good Working Colonies," we find the following:—"The secret of successful honey production consists in always maintaining the proper proportion of adult working bees in relation to the quantity of brood and young bees." That in our working colonies we should always have young queens, and retain none that have seen their second summer. That queens cannot be too prolific, but must do their best before the season opens, after which they will simply keep pace with the wear and tear upon the life of the workers. To provide that the best powers of the queen shall be used up before actual storage commences, we are to have young queens in very strong colonies the fall before.

There is much valuable advice given in the chapter on planting for bees, and we are assured that *systematic planting makes profits certain*.

I was much interested in feeding and feeders, buying, packing and moving bees, and especially in the production of wax, non-use of foundation, and management for heather honey.

It gave me great pleasure to see the following under queen-rearing:—"It has been observed that a young queen feeds upon pollen extensively until she has met the drone, from which time she is fed by the bees entirely upon digested food. Now just here I wish to show the folly of keeping young queens confined in the frame nurseries for a number of days after hatching, as is done extensively in several American queen-rearing apiaries. Without the nitrogenous food at this time when the constitution should be established, they are dragging out their existence upon sugar alone at the most important period of their growth."

Mr. Simmins believes, as does Mr. Alley, that better queens can be reared by proper artificial means than under the swarming impulse.

In justice to the author I refrain from giving more of this book, but I can assure the readers that I have given but a small part of its good points. This work is now for sale in this country. It contains nearly 200 pages, and is well illustrated. I advise all progressive beekeepers (especially those who make it a business) to thoroughly study this book.

PRACTICAL HINTS IN BEEKEEPING.

By HENRY ALLEY.

From *American Apiculturist*, March, 1888.

OVERSTOCKING—PLANTING FOR HONEY—HOME MARKET—HONEY ON COMMISSION—EXPERIMENTING—FOUL BROOD—HIVES—FEEDING, ETC.

It seems to us that essays on the subject of "Practical Hints," by such well-known beekeepers as those who were invited to write them for this issue of the *Apiculturist*, must

be of great value alike to the old veteran and novice in bee culture.

Although at this date not any manuscript for the essays has reached us, yet we have an idea that the readers of the *Api* will get the most valuable hints which, if followed, will, as a rule, lead to success in most cases. The contributors are known as among some of the best and most practical writers connected with bee culture.

Perhaps it will not be out of place if the manager of the *Api* makes an attempt to give a few practical hints to his readers.

OVERSTOCKING.

The enterprising Yankee when he enters most any kind of business is very apt to go in pretty steep and in some cases overdo the thing and fails, or gets discouraged, not having the patience to wait for returns which are sure to come sooner or later.

One reason why a good many who have started in beekeeping have failed was because of overstocking. If one hundred colonies are placed in a location where there is but forage enough to support properly twenty-five or fifty colonies, one will not have long to wait to know that beekeeping in such a place cannot be made a success. From twenty-five to fifty colonies of bees will do well five seasons out of six in most any country town in New England. I refer to a location where there is no basswood forage, and where the bees depend largely on fruit blossoms and white clover and have a fair chance to forage on late fall flowers. Well, now if twenty-five colonies do well, do not increase the apiary to fifty or more colonies at one jump. If twenty-five or thirty colonies have done extra well for three years in succession, the apiary may safely be increased to fifty colonies. Then wait two years, and if the fifty colonies seem to store large amounts of surplus honey, the apiary can be further increased. Do not attempt to make beekeeping a special business unless your apiary is situated where basswood and white clover are very abundant.

PLANTING FOR HONEY.

The statements made in the *Api* of the new honey plants by Mr. Tyrel and others have satisfied me that it will pay to plant for honey. If a plant can be found that will produce honey of a good quality in a wet season, and one on which bees will work while the weather is such that white clover and other bloom yield no honey, then the beekeeper has nothing to fear so far as a honey dearth is concerned. All who keep bees are not so situated that they can plant for honey, yet in most country places there is plenty of waste land that may be secured at a low price and on which one may plant and utilise for the use of his apiary; therefore we say, plant for honey, it will pay.

HOME MARKET.

The small beekeeper, and those who have other business besides keeping bees are not

prepared to ship their honey to distant cities for a market in order to find a ready sale for the products of their apiaries. It does not require very extensive or expensive advertising to develop a home market. Place the price of your honey at such a low figure that everyone can afford to purchase it. Let the people who think they can go out of town and get better honey by paying higher prices go and do it. Have a good quality of honey where all who desire can taste it, and nine out of every ten persons who do so will purchase more or less for their families. If you have a poor quality of honey, be honest and tell each purchaser that you have honey but that the quality is not as good as it is some seasons. As to which is the best and most profitable to raise, comb or extracted honey, each one must decide that matter for himself. The demand in any particular locality will be the best criterion to go by.

Do not tell your townspeople that your bees have "made" a big lot of honey. One need not give himself or his business away to his neighbors. A man who kept bees in Wenham, some twenty years ago, was so well pleased with his success one season that he told his neighbors all about it. The man who kept the bees had but one acre of land, and those who owned more or less in the same town accused the beekeeper of robbing them. They said his bees must have got all the honey away from home and in less than two years he was driven, bees and all, from town. 'Tis a dangerous thing to make known your success in any kind of business.

SHIPPING HONEY TO COMMISSION MEN.

I have always discouraged shipping honey to be sold on commission. The commission man has but two motives in dealing in honey: first, the profit or percentage; second, to get it out of his way as soon as possible. The commission merchant gets his percentage whether the producer gets any profit or not,—that does not concern the merchant.

I know it is almost impossible to get any dealer to take honey by the tons or carload and pay cash for it, yet there are some who will do it. In my opinion, it would be a good move for the large honey producers to lease a building in cities or large towns and ship their honey there and employ an honest and trusty person to sell it. If such places are established, a uniform price might be placed upon honey. The large honey producers could purchase the crop of the small beekeepers, and thus, to a great extent, control the markets. This is an experiment worth testing, and it may work well.

EXPERIMENTING IN THE APIARY.

If there are any people who have a strong desire to conduct experiments in their vocation, it is beekeepers; and we think nearly all who keep bees have experimented more or less: the testing of different styles and sizes of frames, hives, honey-boards, division-

boards, feeders, etc. etc. This is all right. Well conducted and careful experiments are just what will bring perfection in the end. Continue to experiment and thus amuse and instruct yourself. We have spent hundreds of days in experimenting and intend to keep at it until perfection has been reached. One of the practical and best objects to experiment for is the improvement in a race or strain of bees. Cross up the different races and strains, and if a careful record is kept of such experiments the results will be beneficial and satisfactory to yourselves, and to the beekeeping fraternity if such experiments are made public. Experimenting with frames and hives will hardly prove as satisfactory as many other experiments. Experiments in contraction of the brood-chamber or for building up colonies rapidly in the spring will be productive of good results, and so also will experiments in queen-rearing and fertilisation of queens by particular drones. Don't waste much time in inventing bee-feeders. The simplest kind of an arrangement for a feeder and feeding bees is the best, and all such are well-known to every person who reads and keeps himself posted.

FOUL BROOD.

Foul brood is the terror of the beekeeper in some localities. To experiment for its cure, results in loss of time and money. An apiary in which this disease has once got a good hold is in the condition of a pest-house to which the public may have free access. All the apiaries for miles around will sooner or later be infected by foul brood unless vigorous and prompt measures are taken to annihilate everything of the combs, bees and honey, and in most cases, the hives should be destroyed. We shall advise you to destroy all as soon as possible after the disease has made its appearance. First get some person who knows his business to examine the combs and brood. If he decides that your bees are infected by foul brood, lose no time in ridding your apiary of it. When you have thoroughly cleaned up everything that might be a means of communicating the disease to other colonies, then go a long distance and get a new lot of bees after thoroughly examining the stock and assuring yourself that the colonies you can purchase are perfectly healthy in all respects.

ABOUT HIVES.

If you have a hive in use that seems to be well adapted to your location, I would not change even if satisfied that some one else has a better one. 'Tis best to let well enough alone. Nevertheless, it would be hard to find a beekeeper who is thoroughly satisfied with the hive he uses, since no hive is perfect, and we never saw a beekeeper who was not always ready to test a hive when it was plain to him that some other hive had many good features that his own did not possess. Under such circumstances only would we advise any one to purchase new hives and other bee fixtures.

I despise a beehive that is large enough, or has lumber enough in it to construct a tenement house. We have two hives in our apiary sent us for trial, very good hives, but they are large enough for a hen-coop. Why make a hive that has space enough between the outer case and brood-chamber for ten bushels of shavings to pack it for winter. Such large hives are a nuisance in the apiary.

FEEDING ARTIFICIAL POLLEN.

For thirty years we have made it a practice to feed wheat flour to bees for early pollen. I know that nearly all who speak of this matter will say "feed rye meal." We know from long experience that wheat-flour is the proper material to give the bees. We take the cap of an L. hive, invert it, place the flour in it and then set it under the south side of a building, or in any sheltered place, and very near the apiary, too. The bees are easily started to work in the flour by placing a small piece of comb containing honey in the flour. We also place a piece of dry comb in the box for the bees to light upon and work the flour into little pellets upon their legs. If beer need pollen before it can be obtained from early flowers, why not give them such material that they can quickly take into the hive? They can do it with flour.

SOCIALITY AMONG BEEKEEPERS.

Beekeepers as a class are not apt to "hide their light under a bushel." As a rule, they often meet and talk about bees and bee matters, and talk over the little experiments they have been working upon. In this way much valuable information has been gained to all concerned.

When there were beekeepers in this vicinity with whom I could meet and talk bees for a while I could enjoy myself. Now the nearest beekeeper is four miles away and then we do not have the time to spend in such a way. Our advice is to meet and converse upon bees as often as possible, talk over the best method for wintering bees, best way to market honey, best hives, etc.—*Wenham, Mass.*

THE ENTRANCES TO HIVES, AND VENTILATION.

Written for the American Bee Journal.

QUERY 503.—1. What kind of hive entrance do you prefer—the dimensions, how contracted, etc.? 2. Does this entrance furnish all the ventilation necessary?—*Goshen, N.Y.*

1. I use an entrance $\frac{3}{4}$ x 14 inches, contracted by entrance-blocks. 2. Yes.—*G. M. DOOLITTLE.*

1. The full width of the hive and $\frac{3}{4}$ of an inch deep. 2. Yes.—*C. H. DUBBERS.*

1. The one usually made in the Langstroth hive— $\frac{1}{2}$ -inch deep and the whole width of the hive, contracted by two three-cornered entrance blocks. 2. Yes, Usually.—*EUGENE SEIGER.*

1. Eight inches long, and $\frac{1}{4}$ -inch high. Contract by use of the blocks similar to the

entrance-blocks of the Langstroth hive. Contracting the entrance is seldom necessary. I leave them wide open in winter. 2. Yes.—*M. MAHIN.*

1. The full width of the front end of the hive, and $\frac{3}{4}$ of an inch high; contract it with entrance-blocks. 2. Usually it does, but not always.—*A. B. MASON.*

1. On the whole I prefer it $\frac{1}{2}$ -inch by 8 or 10 inches, and contract the size by the Langstroth triangular blocks.—*A. J. COOK.*

1. One $\frac{1}{2}$ -inch high, and the full width of the hive, to be contracted as needed by a block or stick. 2. Yes.—*C. C. MILLER.*

The full width of the hive, and $\frac{3}{4}$ of an inch wide. Contract it with right-angled blocks in the early spring. In the summer and winter have the full entrance open, and furnish necessary ventilation.—*MRS. L. HARRISON.*

One $\frac{1}{2}$ -inch wide, and the whole width of the front of the hive; contractions to be made with the Langstroth entrance-blocks. Such an entrance furnishes as much ventilation as is needed, so far as I know.—*W. Z. HUTCHINSON.*

Ten inches wide and 5-16 of an inch deep. Besides in the summer we raise the hive from the bottom, and give as much as two inches room in depth in front. We leave the back closed.—*DADANT & SON.*

1. I prefer the entrance 10 or 12 inches long, $\frac{1}{2}$ -inch wide, which I contract as occasion requires, either by slides or by triangular blocks. 2. It will, if the hive be properly shaded.—*J. P. H. BROWN.*

1. I prefer an entrance $\frac{1}{2}$ -inch by 11 inches, and to have it come beneath rather than at the ends of the brood-frames, as usually provided. This kind of an entrance is quite effectual against robber bees, and with full colonies it needs no contraction at any time of the year. 2. On very hot days I give further ventilation at the top of the hive.—*G. L. TINKER.*

1. I use the Langstroth hive 14 inches wide, and give an entrance the whole width of same. 2. Yes, ordinarily, if shade of some kind is used to guard against the sun.—*J. E. POND.*

The whole width of the hive and $\frac{3}{4}$ of an inch deep, contracted by the entrance blocks. 2. It will until it gets very warm, then I raise the hive up on little blocks $\frac{1}{2}$ -inch by one inch, placed under each corner. That will raise the hive $\frac{1}{2}$ -inch from the bottom-board all round, except in front, which will be $\frac{1}{4}$ of an inch.—*H. D. CURTING.*

1. I use and prefer the entrance to the hive to be on a level with the bottom-board of the hive. I prefer this style of entrance for too many reasons to be mentioned here. A slight pitch to the front will drain the bottom-board of all moisture. I make the entrance $\frac{3}{4}$ of an inch high, and full width of the hive. I contract it by means of two blocks that can be moved at will. I have had no trouble with this arrangement in any way. 2. The ven-

tilation is ample except in excessively hot weather, at which time the hive-covers can be raised slightly, to the comfort of the bees.—G. W. DEMAREE.

I use and prefer an opening of from $\frac{1}{2}$ to $\frac{3}{4}$ of an inch, and clear across the end of my hive, which is $11\frac{1}{2}$ inches. I prefer the triangular Langstroth blocks to the many devices that I have tested, and all I have ever heard of. These entrances, with the aid of the bees, furnish all the ventilation needed; all upward ventilation in summer has proved worse than useless with me.—JAMES HEDDON.

I prefer an entrance made by cutting a piece $\frac{3}{4}$ of an inch deep out of the front end of the bottom-board, extending clear across the front end, running to a point something like a V, about four inches from the front end. Give a full entrance by pushing the hive even with the first end, which gives all necessary ventilation. The entrance is reduced by sliding the hive back.—R. L. TAYLOR.

1. The entrance should be the full width of the hive, and about $\frac{3}{4}$ of an inch deep. The triangular blocks of the Langstroth hive are about as good as we could wish. 2. The ventilation secured at the entrance of the hive is usually sufficient.—THE EDITOR

BEES NATIVES OF ENGLAND.

From British Bee Journal.

BEES are mentioned in some of our earliest national records, and the mention of them is such as demonstrates how highly they were valued. Nor is this a cause for surprise, inasmuch as that mead or metheglin was the choicest drink of the Britons' feasts; and although the household of the Prince of Wales one thousand years ago comprised but twenty-four officials, the eleventh of them was the mead-maker, and he ranked next before the royal physician.

So highly was superior mead prized in those days that one of the royal privileges was to have the first offer of every cask that was intended to be sold.

We are accustomed to consider our forefathers of those days as rude and barbarous, and they were so if measured by our present standards of habits and education, but compared with contemporary nations they appear to advantage, for their laws and customs were fully equal in good sense to those of their neighbors on the Continent. As an illustration we will quote from the laws relative to bees enforced by Howel Dha, who was chief ruler of Wales about A.D. 940.

"OF THE PRICE OF BEES.

An old hive is valued at 24 pence.

A spring swarm at 16 pence.

A second swarm at 12 pence.

A swarm from a first swarm at 12 pence.

A swarm from a second swarm at 8 pence.

A swarm after the Calends of August at 4 pence, and that shall be the price until the Calends of November.

After the Calends of November an old hive is valued at 24 pence, and the swarm which came off after the Calends of August shall not be considered as an old swarm before the Calends of May, and then it shall be valued at 24 pence.

Three huntings are free (that is, you may follow them upon another man's ground), of a swarm of bees settled upon a branch, and of a Fox, and of an Otter, because they have no certain abode.

Bees were first born in Paradise, and were driven thence on account of man's sin, but God blessed them: therefore mass ought not to be sung without their wax being present.

He who fuds a swarm resting on a branch in another man's land shall receive 4 pence from the possessor of the land, if the latter wishes to retain the swarm.

No swarm shall be valued at more than 4 pence until it has remained quietly for three days and three nights in the same place, and that in fine weather. Of those days the first is required to ascertain whether it will settle; another in examining whether it will cluster, and the third whether it will continue here." *Wotton's Leges Wallice, page 254.*

Inquirers' Column.

CAN you assign any reason why colonies of bees begin a civil war amongst themselves? A large colony with plenty of sealed honey, but little coming in at the time, so began to fight, until half their number and the queen (which had only been introduced a few days previous) was slain.—TASMAN.

It may be noticed that in opening a hive which has no mat on the top of the frames or section boxes, that a large number of bees are congregated on the top, who are apparently doing nothing particular, but are distended with honey, so much so, that, although the stock may be but Hybrid, these bees would give the impression that a purely-mated queen was within—showing clearly three bands, in consequence of the fullness of honey distending their bodies. Are they loafers, or are they fulfilling any important or secondary part?—TASMAN.

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BEE KEEPER'S
JOURNAL

EDITED BY
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J. H. KITCHEN.



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JOURNAL.

VOL. II.—No. 12.]

JUNE, 1888.

[PRICE 6D.

Editorial.

NOTICE.

We beg to inform our readers that the present number completes the Second Volume of the *Australian Beekeepers' Journal*, and that, as it is intended to continue its publication, we request our subscribers to notify us as soon as convenient of any change in address, or of any intention to discontinue subscriptions. At the same time we hope our readers will send in the names of new subscribers for the new volume.

HINTS FOR JULY.

This month is generally the coldest of the year and the lowest temperatures at night are usually experienced in July and early in August. On bright sunny days the temperature at mid-day is often quite high for the winter and bees appear as busy as on a summer's day, getting whatever stores are available, and there is generally something to be got from late flowering eucalypts and other shrubs. It is on such days that inspections of our stocks should be made, if such a course is really necessary or very desirable, otherwise it is far better to leave them alone so long as they have plenty of food, and one can generally judge upon that point by the weight of the hive, unless the stock is weak, in which case it will be absolutely necessary to help them on, for which purpose it will be requisite to open the hive occasionally.

Sometimes we find stocks getting into an unhealthy condition, which will be indicated by numbers of dead or dying bees about the entrance and probably fecal stains on the alighting board; and if the hive be lifted from the bottom board perhaps a number of dead bees will be found, which the others fail to remove. This state of affairs goes on from

bad to worse, though sometimes the bees recover and get thoroughly healthy again. If, however, as we have often observed, this unhealthy condition is accompanied by the appearance of the shiny or hairless bee, it shows the presence of the disease germ known as the *Bacillus gaytonii*, and unless grappled with at once, will often destroy the colony. The course we have successfully adopted is to put all the combs and bees into a new hive, remove all the combs with sealed honey, giving only such as are empty or have unsealed honey, and feed freely on syrup with a little salt added. The disease evidently commences with a kind of fermentation in the alimentary cavities of the bees, weakening them so much as to affect the brood, and rendering them open to invasion by the *bacillus* or disease germ, so that many of the young bees are hatched, not fully developed, but diseased and hairless.

At this time the wise beekeeper will get all his hives, frames, &c., in order, well cleaned up (and, if necessary, scalded), re-painted, &c., getting everything ready for spring work before the end of August.

If combs of honey or partly-filled sections have been put away for use next season they should be looked to from time to time, to see they do not get attacked by mice or moths, or get damp and mildew. They should be kept wrapped in brown paper, and kept on dry shelves out of the reach of mice, or else placed in clean hives thoroughly closed against insects of all kinds, as well as other marauders, and kept in a dry, but cool place.

Hives that have been occupied by bees that have had foul brood, or any disease, should be scraped and cleaned, and then washed thoroughly with hot water and carbolic soap, and even after that painted over inside with carbolic wash—one part Calvert's No. 5 to ten parts of water—and carefully dried in the sun. Those who have the means of getting steam

from a boiler cannot do better than put such hives inside a larger box with a few holes in the bottom, and give them a good cleansing with hot steam, which, entering all the crevices with a high temperature, destroys all germs of disease.

MANUFACTURED HONEY IN MELBOURNE.

At the Meeting of the Victoria Beekeepers' Association, on the 28th May, samples of a material in bottles and labelled *Pure Garden Honey from Orange Flowers*, purchased from storekeepers in Melbourne, and with a brand of a local manufacturer on it, was submitted to the members as a specimen of how clever people are now in manufacturing imitations of natural products. It was at once pronounced by members present as a material made up of glucose and sugar with possibly a small percentage of honey, and flavoured with a trace of oil of orange flower. It was stated that tons of this was on the market and a resolution was passed that steps should be immediately taken to expose this fraudulent practice, and it was arranged to obtain analyses of the samples purchased to prove beyond any doubt the fact of their being manufactured imitations. By reference to the proceedings of the Association our readers will see what transpired at the meeting, and among our correspondence in the present number will be found a letter signed "Tasman" on the same subject.

The imitation honey has been largely manufactured in both America and England, but the Governments have by repeated and vigorous prosecutions put a stop to such a nefarious practice.

The imitation honey, although not markedly injurious to the consumer, can scarcely be regarded as a wholesome food when compared with pure honey, and is undoubtedly worse in comparison with it than butterine is to butter. The chief fraud on the public is labelling it *Pure Garden Honey*, and we sincerely trust the Association will be able to thoroughly expose it, for it has a most injurious effect on what is now becoming an important industry for our country people.

It is a great pity people do not know more about what constitutes good honey, and it is strange that a peculiar characteristic of the purity of honey is often regarded by the public as a sign of adulteration, viz., *granulation* or *crystallisation*. Good honey, if ripe, will granulate even in moderately cool weather; manufactured or adulterated honey *never* does, and an experienced beekeeper knows by the way honey moves in a vessel whether it is pure or not.

On the part of the general public, as well as of our beekeepers, it is to be hoped this tampering with one of our important natural product foods will be soon put a stop to and that, if

the public care to purchase glucose and American corn syrups flavoured with a little essence, instead of honey, the manufacturer should be compelled by the Administration of our Adulterated Food Act to label their products honestly and openly as *Corn Syrup*, *Glucose*, or *Confectioners' Honey*, so that people may know what they are buying.

HIVES.

Continued from page 165.

WHATEVER form of Hive a beekeeper determines upon he will find it wise to stick to it, more especially as regards dimensions of boxes, frames, fittings, &c., so that every part of one hive will fit on to or into every part of another. Every box and frame must therefore be exactly of the same sizes to a sixteenth of an inch. This will be also true of ordinary box hives as we have already pointed out, for a beekeeper using box hives will find his work more easily and better done, with more comfort to himself and his bees if his boxes are all exactly the same size.

The adoption of the 1-lb section-boxes for comb honey for the market has now become so general, and comb honey in that form being in great demand and commanding good prices, it will be the aim of every beekeeper to obtain some at least of his surplus in that form; it will be well, therefore, to adopt a size and form of hive-box that will accommodate a definite number of sections. The measurement of the ordinary 1-lb. section-box is $4\frac{1}{4}$ by $4\frac{1}{4}$ inches and nearly 2 inches wide, so that four placed end to end will occupy 17 inches, and seven side to side will occupy 14 inches nearly, and as the inside of a Langstroth hive is $18\frac{1}{2}$ by 14 inches, twenty-eight section-boxes will pack in nicely leaving just room for a light frame or crate to keep them in position. In any deviation from the size of the Langstroth it would therefore be well to use a size to carry a certain number of section-boxes.

As this article is intended to assist beginners in the art, as well as more experienced Beekeepers, it may be well to now describe the methods of managing frame hives, so as to avoid the troubles and difficulties that come to all who work unskillfully or without a knowledge of the ways of bees. We must suppose that a certain kind of frame-hive has been selected, and that a colony of bees with four or five frames of comb with honey brood, &c., has been placed therein, the hive placed in a good position on a stand of some kind, or on the ground, the bottom board level, the entrance free and clear, and the roof weather tight.

1st. The frames may be either parallel with the front and back as in the English and German hives, or parallel with the sides, as in the case of most American hives, and also of the Langstroth hive now largely adopted in Australia. It must be remembered the front

of the hive is the side in which the entrance is placed. Some Beekeepers have called the former plan the *hot system* and the second the *cold system*, because the latter allows of a much more ready ventilation than the former way. If the frames are placed parallel with the sides, the centre of the first frame should be $\frac{3}{4}$ -of-an-inch from one side of the hive, and the distance of the other frames from the centre of another should be about $1\frac{1}{4}$ -inches, some prefer $1\frac{3}{4}$ or even $1\frac{1}{2}$ for the brood frames. At all events frames for honey storage may be a little wider than those for brood.

Spacers. In order to easily place the frames the proper distance one from another, many devices are adopted. Among British beekeepers *metal ends* are much used for this purpose, these are little castings of lead that can be slipped on to the ends of the top bar of the frames and project $\frac{5}{16}$ -of-an-inch each side, so that when the frames are pushed close together these projections keep them about $\frac{3}{4}$ -of-an-inch one from another or $1\frac{1}{2}$ inches from centre to centre of frame. Some English hive makers adopt a shouldered frame, that is a frame whose top bar has a projecting shoulder at each end, making it $1\frac{1}{2}$ inches wide, the extra $\frac{3}{4}$ -of-an-inch, or shoulder at the ends, being on opposite sides of the top bar. German hive makers usually have four nails driven into the sides of the frames, two on the top bar on opposite sides, near the ends, and two in similar positions on the bottom bars. This is necessary in the form of hive used in Germany and many parts of the continent, which opens at the back, and the frames are slid in parallel with back and front, in grooves cut in the hive sides. One can not see to space the frames therefore, but, with the spacing nails, the frames are spaced properly by pushing them close up towards the front one after another, but there must be two little blocks or nails inside the front of the hive in positions corresponding to the nails on the frames, to keep the first frame parallel. This mode of spacing frames has this advantage that when all the frames are pushed home and secured, the hives will travel safely even when full of brood and honey. Some beekeepers use nails on the top frames of Langstroth's hives as spacers, which are generally placed on opposite sides of the top frames, near the ends, each nail projecting $\frac{3}{4}$ -of-an-inch.

Experienced beekeepers as a rule, dispense with all contrivances of this sort, for one very quickly learns to space the frames pretty correctly by the eye or even by the *feel of the fingers*, and look upon all forms of spacers as useless and an encumbrance. Beginners will probably do better by using some form of spacer until he can set his frames truly and quickly by the eye alone, or he may be troubled with some combs being double or irregular from too wide spacing, while others will have the cells built only on one side through too close spacing. After a little ex-

perience however, it is likely he will come to the same conclusion about these contrivances as the veterans in art. Still with those who only keep a few stocks for amusement, a handy form of spacer will be found very convenient, for replacing frames after opening up a hive is done safely, accurately, and quickly, by simply pushing them bodily to one side of the hive; and moreover he will find his combs built straighter and flatter by having the spacing accurate and always alike, but a beekeeper with twenty hives or more will soon discard such contrivances.

Dummies or Division Boards. We think no hive is complete without a dummy or division board, this is simply a board a little larger than the frames, and with a bar on the top exactly like the frame top bar, the dummy then goes into the hive like a frame and forms a division board to separate one part of the hive from another. It should be made of such a size that it will slip into the hive easily and rest on the rabbet or runner like the frames do; there should be the same space between the bottom of the dummy and the bottom board as in the case of the frames; around the sides however it may be just clear but without room for the bees to pass round. Mr. Simmins, however, in his form of hives recommends they should be exactly the size of the frame which allows of bee space at the ends as well as at the bottoms, and he contends this is desirable for proper ventilation.

Very good dummies can be made by nailing thin boards, say $\frac{1}{4}$ -inch thick on one or on both sides of empty frames.

Now for the uses of the dummy. A Langstroth hive will hold ten frames properly spaced, or nine frames and a dummy; if there were ten frames full of bees it would be almost impossible to lift any out without crushing or at least squeezing and so angering the bees, but if there be nine frames and a dummy it will be easy to lift out the dummy, which will give room to slide the frames gently apart before lifting. Besides nine frames in the brood chamber of a Langstroth are ample, and many apiarists now reduce the number to eight.

If there are less than nine frames the dummy is kept close up to the outside one, this keeps the bees more together, in a more compact body, which is so necessary during winter and in breeding time, and especially when the colonies are not very strong. We would sooner have a stock well covering four frames kept close up by a dummy, than one sparsely covering eight or nine frames. Keeping them pretty closely packed helps them in almost every way. When bees get a little quiet after the honey season, it is always best to remove all combs they do not actually cover, and keep them on a less number with the dummy, and even removing other frames if they dwindle down in numbers. The frames removed may be put on the other side of the division board,

or removed from the hive altogether. This *tucking up* of bees with a dummy will help them very much and save many a weak stock, which if left to wander over a lot of combs frequently dwindle seriously, apparently because they do not keep in a sufficient compact cluster to keep up the necessary heat for hatching brood, and maintaining the health of the colony.

In the spring time when breeding commences the dummy must be moved back and a frame inserted from time to time as appears necessary, bearing in mind the bees should *always be kept crowded* till within two or three weeks of the commencement of the swarming season.

Proceedings of Beekeepers' Associations.

A meeting of the Victorian Beekeepers' Association, was held May 28th, at the rooms of the Athenaeum; Mr. Ellery in the Chair. Present, 10 members. Mr. Wilson, of Mentone, submitted several questions regarding supering when working for comb-honey, which were placed under discussion and replies given.

The Acting Secretary placed upon the table a bottle which he had purchased containing a mixture which is largely sold in Melbourne as honey, and labelled as such, but which apparently contained no part of honey. After being tested by the members present, it was decided that steps should be taken to expose the fraud which is being perpetrated upon the public, and use means if possible to stop the sale of it. The President and Secretary were requested to take the matter in hand and report next meeting. Mr. John Stevens, an ex-member of the British Bee Association and the holder of an expert's certificate from that body was present, and was duly elected as a member.

Mr. L. Chambers exhibited a shallow hanging frame and dummy board, which he is making for his own use next season. The next meeting was fixed June 24th, when a large attendance of members is requested to further deal with the question of spurious and adulterated honey. Members were also requested to bring for exhibition samples of this season's honey, both comb and extracted.

It was decided to invite country members to send in to the Secretary a statement of operations for past season, as under:

Number of Stocks, Sept. 1st, 1888.

Increase by natural or artificial swarming.

Total yield of honey, stating number of pounds each, extracted and comb.

Chief sources of honey.

When gathered.

What kind of bees worked.

If foul brood has manifested itself, and if so what steps have been used to eradicate it. And it was also agreed to particularly request

that the sources of honey be noted, and to notify that the President will be glad to receive flowers or leaves and seed pod, of any species of *Eucalypts* or other native plants or tree, from which honey is gathered.

NOTE. The Secretary desires us to notify in our columns these wishes of the Association to our country readers and to ask any beekeepers who can comply with the latter request to send their name and address with any samples. The Acting Secretary's address is, L. T. Chambers, 18 Franklin-street, West Melbourne.—[Ed.]

MT. BARKER BEE ASSOCIATION.

On Saturday last the President and several members of the Mount Barker Bee Association paid a visit to Mr. Hallowell's apiary in Creep-mouse Gully, on the old road to Echunga. On the way notice was attracted by Mr. T. Paltridge's single hive, which shone whitely out from the surrounding stinkwort. Amusement was caused elsewhere by the sight of a primitive hive affixed on the side of a tree for the purpose of enticing bees from out a hollow near by. A printed notice of the intent of the offered home was omitted, and so the honey-makers remained where they were. A number of boxes were noticed under some logs on the left of the telegraph track, and a member remarked the apiarist was there put to little or no expense. "And gets little or no honey," was the quiet reply of the expert of the party. Arrived at Mr. Hallowell's, evidence of intelligent hard work was everywhere apparent. During the few years he has been in possession of the land he has put in 340 fruit trees—exclusive of eleven killed by hares out of the dozen planted in the first year of his occupancy. The method now adopted to keep off the vermin is to drive close stakes round the stems. Mr. Hallowell has manifested especial ingenuity in connection with the beekeeping industry. From the lead lining of tea boxes he cast rollers on which projections were afterwards cut to the proper gauge for making comb foundation. With this contrivance Mr. Hallowell does all needed work in this department. He has also fitted up a workshop in which he makes all the hives required, and as there are 97 tenanted by strong swarms, it will be seen that there is a considerable amount of work for him to do. In the first year, season 1886-7, he began with four swarms, which having yielded 1½ tons of honey in the meanwhile, had increased to 27 at the end of the season. Three were then bought, bringing the total to level numbers. This year a dozen swarms were bought and the gross total was once increased to 104, but the amalgamation of several weak swarms brought it down to 97 as stated. Mr. Hallowell is making 500 hives for next season, and hopes to have them all occupied by strong colonies of busy workers. The situation chosen for the apiary is on rising ground slant

in to north, west, and south, and facing down the valley towards the rising sun. There is "ample room and verge enough" for a city of hives much greater than that proposed. In order to feed the bees between last season and this Mr. Hallewell filled the lower compartment of each hive with about 40lbs of honey, saw that each swarm had a queen, and reduced the entrance so that only three or four bees could enter at a time, and so minimised the danger of robbing. All 31 hives so treated came out strong and healthy at the beginning of this season. Owing to the absence of natural food it has cost Mr. Hallewell £15 to keep his bees going of late, the average consumption being a 70lb. bag of sugar a week. The method now adopted for feeding is to keep the bees in the lower compartment, leaving a small hole in the top, over which is placed—either just below the roof or under a smaller box—a float containing the required food. The entrance to the hive is diminished, and so alien bees if they come at all must do so in very small numbers, and must go right through the hive before a robbery can be effected. Of course some of the necessary apian appliances have had to be purchased, but wherever possible Mr. Hallewell makes them for himself, because, although almost every conceivable need can now be supplied, the process is too costly to be lavishly indulged in except by men who keep bees more for pleasure than profit. At the time of this visit the bees had begun to find natural food again, and were busy making the best of the bright day. Unfortunately an examination of some of the oldest hives discovered lurking symptoms of the accursed foul brood. Mr. Hallewell has a specific which is guaranteed to cure this fatal disease, but the President puts no faith in it, and advises resort to drastic measures. Mr. Hallewell's property is situated in a very pretty position. The ground slopes in from the back and both sides, and right in front is the "Mount" and the rising sun, while the color of decaying leaves and the glossy green of the wattles are framed in by the belt of sombre gums beyond. The prospect is extremely pleasant for the human inhabitants, and when gums are in flower, it must be a very paradise for bees. A hundred acres of the land carry the profitable wattle, from the leaf joints of which honey is said to be obtainable. *Mount Barker Courier*, April 27th, 1888.

News and Reports from Colonial Apiaries.

WE hear that a Bee-farm Company has been formed in the Hamilton District, under the title of "The Victorian Bee Company," capital to be in 2,000 shares of £1; which will take over the whole stock of Mr. H. Naveau, of that place, and establish a bee-farm in one

of the splendid localities for this purpose near the foot of the Pyrenees. We believe Mr. Naveau will be appointed manager, and that the site to be selected will be near Mt. Abrupt, and not very distant from the Dunkeld Railway Station.

We trust the company will make a good and successful start this season, and show us what can be done by such an industry in our Western District.

This is, we believe, the first instance of the formation of a Bee-farming Company in Victoria; in the neighboring colonies such undertakings have been a financial success.

Original Contributions.

EXTRACTING.

MANY amateurs find a difficulty in extracting when commencing operations which a little careful thought would avoid. The first generally arises from want of necessary appliances, *beside* the extractor and knife. The most essential being some means to hold the frame in position when uncapping, to secure all drip and give a place to scrape the cappings. This may be cheaply made by a tradesman or anyone handy with tools. First, make a box to measure *inside* 18 x 12 x 6, which may be made tight to prevent leakage of honey, by well packing the joints or giving a coating of wax or enamel paint, but is better lined inside with tin, letting the tin project very slightly on one side, to offer a sharp surface for scraping the honey-knife. Notch out to the depth of half-an-inch on either end, close to the side, a small piece sufficient to receive the ears of the frame to rest the top bar, and at a corresponding level fix a bar to rest the bottom bar of the frame upon. This will hold the frame firmly in position, and allow three inches of room for scraping off cappings into the box.

The next trouble which presents itself, is the difficulty of keeping the knife hot enough to work well, for this there is nothing better than a small kerosene lamp stove. Some very excellent ones with cast iron fonts and frames to hold a vessel above the flame are now procurable for a few shillings. With one of these and a deep vessel, such as a quart pot, the water may be kept boiling, and the knife at the necessary heat for working well, even if convenient to extract out of doors. A second knife is a help both of which should be kept as sharp as a good turkey stone can make them.

Practice alone will give the knack of getting off the cappings quickly and cleanly.

The next trouble is that the extractor shows a disposition to waltze about. It should be firmly screwed down to something to make good work, either to a floor or to some heavy timber, but, all these points at last overcome, the complaint often is the honey won't come out. In most cases, the honey has been

capped over so long and allowed to remain in hive that it is too thick for anyone to make a clean job, but the most fruitful cause of trouble is simply placing the frame the wrong way in the extractor. The bottom bar should always be in the lead, whichever way the cage is worked. The reverse motion has a tendency to hold the honey, or a good part of it in the cells, they being built at an angle from the horizontal, especially combs naturally built when honey is coming in fast.

To avoid breaking combs the support of wire is almost necessary—and, for extracting, all frames should be wired with at least four wires either vertically or horizontally. If the frame is wired in the form of an inverted W, the comb will receive the support where most needed.

TASMAN.

HOW TO MARKET HONEY.

WITH the production of honey in any shape in excess of what is wanted for home consumption, or as sweeteners to friends and neighbours, comes the question of selling the surplus. Many beginners begin to be alarmed as soon as they find they have a few hundred-weights of honey on hand, and cannot immediately find a market for it at best prices, forgetting that the market has to be made.

To find or make a market begin at the next door neighbour, and up and down your own street, and all round you. Whatever you do don't go to the grocer or any other tradesman to sell, until they ask for your goods, which they will sooner or later if you work the right way. The grocer has by him some small stock of honey (plus other mixtures), nicely put up in pickle bottles of assorted sizes, with brown or newspaper, patent fly-proof capsules, neatly tied with tape or packing twine. This cost him 3d. per pound and his labour in bottling—and weigh 2-lbs—and they sell when asked for at one shilling; or perhaps he has a more attractive-looking article also put up in pickle bottles, but corked and capsuled with tin foil, and bearing the lying label, "pure garden honey," sometimes with the name of the bottler, which in all probability is one whose chief business is sugar boiling. Let the grocer alone, until he, as others, learns to know what honey is, and how it sells.

Now to launch any business some little trouble and expense must be incurred to introduce oneself and one's wares—and the honey producer is no exception. A few pounds of honey judiciously given away is a splendid advertisement. Having sweetened up all friends and relations, begin next to sell and follow up with neighbours and chance acquaintances, always keeping an eye on the houses where the family is pretty thick round the table. Children from 2 to 40 are very fond of good honey when they can get it.

Pretty soon you will find out that your honey is advertising itself, and the demand

growing, and by-and-bye the sorrowful cry all round will be, "what! no more honey."

My experience is, that once you begin by teaching folks to eat honey they will want it always on the table, and greatly miss it when not there.

In breaking new ground, or introducing your honey anywhere, *always* put it up in good glass packages. A nice jelly glass or clear glass tumbler does not cost much, and is generally accepted as value: you ask for it with your honey, but if purchaser objects, be prepared to allow the return of the package, cost to be deducted from next lot. Get in the thin edge of the wedge, even if you have to sharpen the wedge. It is just as easy to make a honey round as a milk round, and follow it up year by year.

Next to glass packages procure tin, to hold say, 6, 10, 15, 20-lbs parcels, and you may adopt the rule of the trade, and weigh the tin in, making customers acquainted with the fact, explaining that *somebody* must pay for the package, and in point of fact you yourself pay about half, and purchaser other half, being the difference between what the package cost you, and what you realize sold as honey.

By the time you have worked up a nice little trade, your grocery man will have heard something of the excellence of extracted honey, as compared to his smash or glucose syrup, and will begin to make some enquiries. When he does, you can afford to be somewhat independent, but at same time, be prepared to sell to him, allowing him a good margin for profit, and if he still wants to put up in pickle bottles, stipulate that he uses a label with your name and address, and branded "pure extracted honey." Be satisfied to allow him to do the retailing, or most of it, while you grow and supply the honey.

By working this way, you will soon start folks all round your district eating honey, until it is looked upon not as a luxury but a necessity on the table.

If you find you have an inferior quality of honey coming in, following a good, clear sample, always make a difference in price, so teaching buyers that honey is graded same as tea or tobacco—and it may be safely laid down as a rule long ago proved. "The liberal soul shall be made fat."

L. T. CHAMBERS.

Corinella Apiary, Middle Brighton.

Correspondence.

BOGUS HONEY.

No. 60.—There is yearly sold in Melbourne and Suburbs large quantities of an article, bottled and branded "Pure Garden Honey"—truly a lying label—both its sale and labelling a direct infringement of the Act known as the "Adulteration of Food Act." But as grape sugar, glucose, and mucilage are all to be

purchased cheaper than pure honey, an opportunity is afforded the unprincipled manufacturer or dealer to put upon the market a spurious article, and so make a profit that otherwise would not come within his province. This, beside defrauding the purchaser, does injury to the legitimate trader, who supplies honey pure and simple, by bearing down his market by an unjust and fraudulent competition.

This is truly a land flowing with milk and honey, and the latter should be seen upon every breakfast table as well as the former, and may the day soon come when honey as an article of diet is looked upon as a necessity, not a luxury. Both, as food and medicine, it should take a prominent place in all households, especially where children are. But at the present time, how few households are able to possess themselves of a sample of pure honey, while the market is flooded with a spurious article, so that a purchaser, unable to discriminate, is supplied with imitations, made up from cheap and unwholesome materials.

A sample of pure honey will always call for another dip in the same jar when procurable; but honey, like all other things, has its productive value, and the beekeeper well knows what he must obtain to pay him for his time and trouble spent in putting his honey on the market. The production and gathering of honey by the bee is no more a free gift of nature, than the growth of fruit, and requires time and attendance to secure it. Hence it is very unfair to be brought into competition with an article called by its name, but which, being made from waste products, can be produced at much less cost, beside stuffing the market. Under such circumstances the beekeeper finds the gathering of honey unremunerative, and allows to go waste good and wholesome food. The various Legislatures of the United States have placed a firm hand on this evil by suppressing the spurious article, and recognising the production of honey as at least one of the minor industries have helped to encourage it, to the benefit of the home consumption as well as to the export returns, honey and wax taking no mean place in the yearly export figures.

It may safely be asserted that hundreds of tons of honey yearly go to waste in these colonies which might be gathered and stored to the benefit of producer and consumer, but the market requires clearing of base imitations and the public afforded an opportunity of knowing what good, pure honey is; the demand will then quickly grow, and with an increased demand and larger capital invested, prices will be regulated, and before long honey will be looked upon as a staple article of food, and be within the purchasing power of even the poorest, when butter is not to be thought of. It might perhaps be in place here to describe the difference between pure honey and the bogus article, as the unwitting purchaser runs just the same risk of being deceived as in buying shoddy cloth.

Pure honey will demonstrate itself to be good and palatable by taste, having a sweet and pleasant aroma, which is more than mere sweetness. When taken into the mouth it immediately assimilates itself with the saliva; any production of which sugar or glucose is the foundation, has a soft, clammy feeling, as if gum or mucilage were present, very different to pure honey, which rapidly stimulates the flow of the saliva. Flavor it has none, unless imparted by other means. Sweetness it may have to some extent, but such a sweetness that does not ask for more to follow. In appearance it generally has as sleek look, much like mucilage and about its consistency, being made somewhat thick to simulate the genuine article. When honey arrives by ripening or by the effect of cold to a similar consistency, it quickly granulates, so that one of the surest proofs of the purity of honey is found in its granulation, a state in which it is pretty generally rejected by the purchaser in error, supposing that its condition suggests the presence of sugar.

Such honey may be quickly reduced to its original condition by standing in a vessel of water and bringing to a gradual heat until melted. It will rarely afterwards return to the granulated condition.

By the use of the frame hive and the honey extractor a sample of honey may be obtained which, for appearance, is exceedingly attractive to the eye, and being free from all admixture, is as good as it looks. May the day soon come when all frauds are banished from our midst and the really good and wholesome article, pure honey, be upon every table.—Yours,

TASMAN.

Corinella Apiary, Middle Brighton,
May 30, 1888.

USE OF CARBOLIC ACID TO PREVENT ROBBING.

No. 61.—As observations from any beekeeper are always read with interest, will you kindly give the following publicity. A few years ago I objected to the use of carbolie acid for quietening bees, but during this last season I have formed a different opinion on that subject. Frequently I had been troubled with robbing bees in the extracting room, and soon as I lifted the sash to allow the marauders to escape, others endeavoured to get in. Now, this last season, I sprinkled a solution of carbolie acid on to the window sill and about the door of the room, and I was no more troubled with robbers. After the frames had been returned to the hive, robbing commenced there in right earnest. I took a goosefeather and dipped it into a bottle containing carbolie acid solution and touched the entrance of the hive and brushed the joint of the super with it, and in a very short time the robbing ceased altogether.

Although our yield of honey in the Hamilton district has not been so good as we anticipated, yet the autumn has been and still is splendid; all the hives

which have been extracted are full again; but the nights being cold now, the honey is too sticky for extracting. On the 10th May we had a very warm day and consequently I held an inspection. When I came to one of my best Italian hives, I saw drones flying and was taken aback, as I well knew the hive was not queenless; but I at once removed the cover to ascertain the cause. Now, Mr. Editor, I should like to ask a question: Do bees ever make a mistake? This hive of mine certainly has made one. They have taken the fine autumn season for a second spring. When I had removed the quilt and lifted out the frames one by one, I found everything in the most perfect order, every frame full of brood, plenty of honey, plenty of new laid eggs, brood in every state of development, capped drone cells, new drones emerging, and queen cells about five days commenced. Now I am curious to know what they mean; will they really swarm or not, if so, I shall not hinder them, for I give them plenty of stores that they may get through the winter. But I do not think they will venture out now; if they do, I will let you know the result.

H. NAVEAU.

Hamilton, May 15, 1888.

Extracts from Foreign Journals.

THE DRONE.

OUR POOR, SLANDERED DRONE ASKS FOR HIS DAY IN COURT.

Written for the American Bee Journal

BY REV. L. L. LANGSTROTH.

"Virgil, who was a great poet, but not enough of a practical bee-keeper to know a laying from a virgin queen, was the first writer of much note, to have his fling at me. To him I was only an idle knave, born to consume the fruits of others' labors, and deserving no better fate than death, by ignominious expulsion from the industrious Commonwealth. Ever since he so grossly libelled me, to compare one to a drone, is the most orthodox form of denunciation for laziness, gluttony, and what has been called 'general cussedness.'"

Now I am proud to say to this Court, that I can disprove every charge brought against me, by simply proving, that to the best of my ability I fulfil the express object for which I was born. Surely no creature can do any better than this, and excuse me for thinking that few men do as well.

CHARGED WITH LAZINESS.

If any of my enemies had authority to call the roll of my demerits, he would surely begin by accusing me of being too *lazy* to gather any honey. But an expert in points of this kind could remind him, that if he examines my proboscis, he will see that it is much too short for sipping nectar from the opening flowers.

MAKES NO WAX.

I am free to admit that I make no wax, but even Cheshire himself, whose microscopes have fairly turned me inside-out, will tell you that I have not a single wax-secreting gland, and am also without those plastic, trowel-like jaws which enable the worker-bees to mould the wax into such delicate combs.

GATHERS NO POLLEN.

Now do not insinuate, that I might at least employ some of my leisure time in gathering pollen! Can you not see that my thighs have no basket-like grooves, in which it could be packed—and are quite destitute of the hairy bristles by which the workers hold the pollen in place?

ACCUSED OF BEING A LAZY COWARD.

No doubt you have often denounced me as a big, hulking coward, that leaves to the women, the whole defence of the State. Are you not aware that I have no sting to fit me for acting on the offensive? Would that had one proportioned to my bulk! if only that I might make proof of it, upon all who berate me for not accomplishing impossibilities!

I am not at all ashamed to admit that I spend the most of my time, not given to eating, either in sleeping, or in what you are pleased to call, listless moping about the hive. Has it never occurred to you, that if I should try to assume the restless activity of a worker-bee, I could be nothing better than a meddlesome busy-body, perpetually interfering with the necessary business routine? I guess the silly meddler who would put me up to such nonsense, ought more than once to have had a dish-cloth pinned to his rear, to teach him not to bother the women in their work!

MISUNDERSTOOD.

I am sorry to number Shakespeare among those who have misconceived me, by calling me "the lazy, yawning drone"—but as one of my maligners has likened me to Falstaff, I may be allowed to quote in my own defence, what this great braggart, when accused of cowardice, says of himself to the Prince: "Was it for me to kill the heir apparent? Why, thou knowest I am as valiant as Hercules; but beware instinct; the lion will not touch the true prince. Instinct is a great matter, I was a coward on instinct. I shall think the better of myself and thee during my life. I for a valiant lion, and thou for a true prince." I lie not, like the false knight, when I say, that what you call my laziness, is a matter of pure instinct.

With all your boasted reason, you seem to have entirely overlooked the doctrine of the conservation of forces. You upbraid me with consuming so much of the precious honey, to the gathering of which I contribute nothing! Well! if I made a single uncalled-for motion, would not that necessitate an extra consumption of food? What better can I do, then, than to keep as quiet as possible? There is nothing either inside or outside of the hive

which calls for any other line of conduct, until the young queens are on the wing; and as they do not sally forth until long after noon, why should I go abroad any earlier? I can assure you, that if brief excursions were in order, as many hours in the day as the flowers secrete honey, no worker would be earlier to rise, or later to go to bed than myself.

MISREPRESENTED.

I, an idle, lazy, listless loungeur, forsooth! Does any one wish to witness the most perfect embodiment of indelible activity? Let him then look at me, when at the proper time, with an eager, impetuous rush, and a manly, resonant voice, I sally from the hive! See with what amazing speed, I urge, what our old friend Samuel Wagner, called my "circumvolating" flights! For ought you know, I may cover greater distances in describing these vast circles, than the busiest worker, in the longest summer day. There is great need then, that I should be abundantly provisioned for such exhausting excursions, and it is only a law of nature, that on my return from them, all that I carried out with me, should be found to have been used up. If you taunt me either for the full or the empty stomach, I merely ask you if you have never heard of honey-moon trips among your own people, which began with extra full purses, to end only with uncomfortably light ones?

SAVAGE DELIGHT OVER MY DEATH.

To cap the climax of your abuse, what savage delight you take in seeing the workers drive me from my pleasant home! and how glibly you can moralize, over what you call a righteous judgment upon a life spent in gluttony, and inglorious ease! Just as if you did not know that the whole economy of the beehive is founded on the strictest principles of utilitarianism. Is not a worker-bee when disabled by any accident, remorselessly dragged out to die, because it can no longer contribute to the general good? Even so exalted a personage as the queen mother herself, as soon as it is plain that her fertility is too much impaired, has a writ of *supersedeas* served upon her, in favor of one of her own daughters.

Knowing well the law under which I was born, I urge nothing against being put to death when Shakespeare's "pale executioners" deem the day of my prospective usefulness to be over. Truly, the sword of Damocles is suspended over my head, and from the hour of my birth till that of my death, it may fall at any moment. Many bitters are thus mingled with my sweets.

I have time only to mention one more. While I know that most of the young queens come safely back from their wedding excursions, I cannot help sometimes foreboding the worst, when I see that no drone ever returns to tell us of his experience.

APPRECIATED BY BONNOR.

I will close my defence by reminding you how good father of the great Scotch bee-keeper,

Bonnor, showed his appreciation of our persecuted race. It was his custom to watch every year for the first flying drone. Its cheerful hum so filled him with delight, as the happy harbinger of approaching swarms, with their generous harvest of luscious sweets, that he called an instant halt on the work of his busy household, and devoted the rest of the day to holiday feasting. The patron of the drones ought forever to bear the honored name of "Saint Bonnor."

THE DECISION OF THE COURT.

Sir Drone:—This court having heard your defence, declares it to be a true and manly one, all those to the contrary notwithstanding, who would further injure you by calling it nothing more than crafty special pleading. It only regrets its want of power to punish adequately your slanderers. But, alas, my worthy fellow! you must not expect too much from this acquittal. Remember how difficult it is for Truth to overtake a Lie that has got a start of only a single day. No doubt the time will come when those who have been stigmatized as the

"LAZY FATHERS OF THE INDUSTRIOUS HIVE," will be held in due honor by the world; therefore console yourself with this bright hope for the future of your race, while you protest against the lies that have had so many centuries the start of your true story, that you may well despair, in your short lifetime, of ever overtaking them.

MORALS FROM THE DRONE'S PLEA.

It was easy to draw more than one good moral from the drone's plea, such as "Do not give even a dog a bad name, unless you are quite sure he deserves it," but the moral which I think at the present time can hardly help suggesting itself to well read bee-keepers, may be very fairly styled the

MORAL OF THE PROF. WILEY SCIENTIFIC-PLEASANTRY LIE.

It is only too well known, to the sorrow of most of our large honey-producers, that some years ago Prof. H. W. Wiley, an entomologist in the service of the Government at Washington, published substantially this statement viz: That honey-combs, after being manufactured, filled with glucose, and sealed over, all by human skill, so nicely as to escape detection, are largely sold as genuine bees' honey; when the bees have had nothing to do with a single step in the whole cheating process. This absolute falsehood having got a good start as coming from a *scientific man* (?) has widely, at home and abroad, prejudiced the public against buying the purest honey, in the most beautiful combs.

Many times have I heard the above story spoken of either as undoubted truth, or have been asked if it were not the truth. It has been refuted again and again, and large sums of money have been offered by responsible parties, to any one who will produce even a small specimen of such a man-made product; and

yet the story is constantly appearing in print in America, Europe—and not long ago even in Australia. It has found its way into a periodical of as high repute as the *British Bee Journal*, and it sometimes seems to have a greater vitality for mischief, than when at first started out on its hurtful career.

Prof. Wiley, when called upon to account for fabricating such a story, thought it a sufficient excuse to say that he meant it only as a "*scientific pleasantry*." Could any one wish him a harder task than over his own signature to try to stop the march of such an inexcusable utterance? Could there be a stronger condemnation of his conduct in this matter, than the words of Holy Writ? "As a madman who casteth firebrands, arrows and death, so is the man that deceiveth his neighbour and saith, Am I not in sport?"—Prov. xxvi. 18, 19.

Dayton, O., March 8, 1886.

SOUTHERN CALIFORNIA.

From British Bee Journal.

THE honey-bee was introduced into Southern California in March, 1855, by Mr. O. W. Childs, who purchased a few colonies in San Francisco, paying \$1000 per colony for them in that port. Under his care and management the bees multiplied and produced large quantities of comb honey, which he sold readily at \$1 per pound. His success started a boom in the bee business, and in three years afterwards nearly every American resident in Los Angeles city had bees to sell, but the price was a shade lower than that paid by Mr. Childs in San Francisco, for many were anxious to sell their bees at \$5 per colony. The price of honey had gone down to 15 cents per pound. Swarms of bees had escaped from the apiaries and located in hollow trees, clefts in the rocks, and holes in the ground, so that the land was literally flowing with honey. About this time the fruit-growers began to complain that the bees destroyed fruit, and most of the bees were removed to a distance from the city and located in the foothills and at favourable spots, along the foot and the sides of the mountains. In their new homes the bees produced a better quality and a much greater quantity of honey, found in the bloom of the black and white sages that abounded in the hilly and mountainous regions, besides the nectar-yielding indigenous shrubs and plants so abundant in Southern California in those days. From 400 to 500 pounds of honey per hive was considered a fair yield; and as the quantity of honey increased the price decreased, so that 4 and 5 cents per pound was about all that good honey would command. Most of the honey was shipped by sea to foreign countries. A small quantity found a market in New York. The crop of honey in 1876 was enormous, thousands of tons being gathered in Los Angeles county alone, and equally large yields were produced in San Diego county, one person being credited

as the owner of 6000 colonies of bees and producing \$50,000 worth of honey and beeswax. The next year, 1877, proved most disastrous by reason of an extremely dry season. Thousands of colonies of bees perished for want of food, and the spring of 1878 found many apiaries entirely destroyed. Discouragement took a fast hold of the average beekeeper, and to such an extent, that he quitted the business in disgust and never embarked in it again. Low prices for honey have been the rule since 1876 until the present year, when, by reason of a short crop, and the meagre supply of honey on hand, both in California, the Eastern States, and the West Indian Islands, the price of honey has gone up nearly one-half more than it was one year ago, and this right in the face of low-priced sugar, an article that has heretofore governed the price of honey to a great extent.

Amongst the men of means now pouring into Southern California in search of a salubrious climate and a rich soil, that has never failed to give a fine crop of fruit in a hundred years, no doubt many may be found who have in their old homes handled the honey bee, either for profit or pleasure—that pleasure derived from investigating the habits and peculiar instincts of the most wonderful creature in animated nature, seemingly endowed with an intelligence that man himself can hardly measure. To such men, coming, as they mostly do, from northern latitudes, where winter care of bees is often greater than the care and labour bestowed in summer, I would say, Take hold of the bee business in this land of sunshine, where, on an average, there are not 15 days out of the 365 of the year in which the bee is not on the wing—in this land of perpetual bloom, where the honey bee may gather nectar every day in the year. Take hold with your experience, and, keeping step with the progress and advancement that permeates every other branch of business, help the honey bee to gather and store the unlimited quantity of nectar that burdens the bloom of millions on millions of flowers in this favoured land of ours, and safe from the wild winds this wealth of sweetness, that would otherwise be for ever lost to mankind. The health-seeker can hardly find a business so conducive to perfect restoration of health, and the student of science can nowhere find a field that will afford a more interesting and absorbing study than that furnished by the apiary. Very many of our prominent beekeepers have turned their attention to town sites and corner lots, quitting a business that had heretofore yielded them health and wealth, without the risks of speculation, and to-day there are fewer men in the business than there were fifteen years ago.

The orchard and vineyard, the grain field and town site have displaced many a splendid apiary that was considered a good property three or four years ago. Our extensive mountain-ranges afford an abundance of bee pasture in localities where the plough, the

orchard, and vineyard can never go, and the very best use that such places can be put to is to make them the home of the honey bee. San Diego, Ventura, Los Angeles, Santa Barbara, and San Bernardino counties ought to maintain 500,000 colonies of bees, that would produce \$5,000,000 worth of honey and half a million dollars' worth of bees-wax per annum. Nature furnishes the raw material; the honey bee under proper handling, will throw in the necessary amount of industry, if man will take the trouble to throw in a little industry and skill to give to commerce this vast amount of wealth that would add so greatly to the pleasure of the palate as well as to the health of humanity. For it is a fact that pure Californian sage honey contains medicinal properties that, properly used, will add greatly to the health of most people.—C. N. WILSON.

HIVES AND THEIR MANAGEMENT FOR COTTAGERS.

By C. N. WHITE.

From British Bee Journal.

The first question a cottager must solve is, "What hive shall I use?" and we who endeavor to carry out the primary object of the existence of the British and County Associations, viz., the bettering of the condition of the cottager by urging him to adopt a more humane and more profitable system of bee-keeping, should, if we intend to assist him, have put to ourselves and solved this question, "What hive shall I recommend?"

It has frequently been stated that almost anything will do to put bees into. That is quite true; bees may be kept in almost anything in which combs may be built—straw-skep, box or bar-frame hive. I have even seen stocks in old casks, wooden and zinc pails, and have taken from them for the owners a nice lot of honey. But although almost anything may be used and a nice surplus obtained, both the pleasure and the profit are much increased if the bees are kept in suitable hives, well and accurately made, and whether straw-skep box or bar-frame hive, well painted. The best and most economical materials for hive construction are certainly straw and wood. It would, I think, be a pity to banish the straw skep from modern apiaries, for it has a rustic appearance which is greatly valued by many old and some advanced beekeepers. Personally, I should not like to see my apiary without a few stocks in straw skeps, because I like to see that most pleasant (sometimes most annoying) of all sights to a beekeeper—bees swarming. Hence nothing would induce me to entirely prevent natural swarming from skeps.

The object of this article being to assist the cottager I shall be glad, with the Editor's permission, to more fully explain at a future time any part I may not make sufficiently clear.

In the first place, I must recommend the beginner straw skeps worked on the system explained below, or if it is his intention to

become possessed of bar-frame hives I should say commence with the "Champion Cottager." This is a hive which I have designed with a view to its being used on the fixed-comb principle, as when skeps are used, and for the production of sections or run honey. When the fixed-comb system has been given up this hive will not have to be discarded as useless, but may then be used permanently as a section-crate.

Somersham Skep System

The Hives.—Two kinds of hives are used, and these I term *stock hive* and *super*. Both should be closely and neatly made so as to fit accurately either above or below each other; and they are exactly alike in every respect except depth, the stock hive being ten inches and the super six inches without the crown-boards. The outside measurement is exactly fifteen inches across, while the crown-board is sixteen inches across, half an inch thus projecting all round. The crown-board is made of two pieces of light wood about half an inch thick, securely fastened across the grain to prevent warping, the upper half being bevelled half-an-inch, so that the rain running down the side of a super will fall on the bevel of the lower hive and drop from the projecting half-inch of the lower half of the crown-board. The floor-board is similar to the crown-board, except that a piece about six inches wide and three inches deep is cut out of the lower half to give the bees access to the hive through a hole $1\frac{1}{2}$ inches wide by six inches long, cut in the upper half about three inches from the edge. A piece of wood projecting about four inches is then nailed under to act as an alighting-board, and form the floor of the passage into the hive. The object of this arrangement is to allow the bottom edge of the skep to remain perfectly level all round. This is not the case when the entrance is cut out of the floor-board, as that part of the skep immediately over the entrance is sure to fall by pressure above and will then fit no other part of the floor-board. The hole in the crown boards of this kind of hive now in use in this district is two inches wide and eight inches long. This hole is apt to give a little trouble, though the immense advantage it gives over a small circular hole should be more than compensation for it. I now, therefore, recommend what I have found to give little or no trouble, viz., six holes eight inches long, $\frac{3}{4}$ -inch wide, $\frac{3}{4}$ -inch apart and running parallel in the centre of the crown-board.

Management.—For each swarm there should be provided one stock hive and at least two supers, a floorboard and cover—an earthen pan if not too heavy. First give the outside of the hives at least two coats of light-colored paint; if white is used the combs will be less likely to give way when the hive is exposed to the full rays of the sun. In very hot weather it is advisable to shade the hives a little. The bottom edge of the skeps and

inside for about an inch from the bottom should be painted. The edges and about two inches of the floor and crown-boards should also be painted, so that the rain may not be drawn under. This would happen, and the edge of the skeps would soon rot if it and that part of the crown-board and floor-board where it rests were not painted. Having got the hives well painted and thoroughly dry, a swarm headed with a young queen should be obtained. It should weigh about four pounds.

Although the hive is ready we have not considered the site. An open space facing the south should be chosen when practicable, and with the path running behind the hives. Now clear away (and keep away) all weeds and make the ground firm. Four or eight bricks will make a sufficiently good stand, but the one I should prefer, where sleepers can be got, would be two laid side by side with the soil made slanting up to the top edge of the front sleeper, so that heavily-laden bees falling in front of the hive would easily get into it. The stand should be set as level as possible and then the floor-board should be placed on the spot the stock will occupy. This must be made perfectly level both ways by means of a spirit level, which may be obtained for a few pence, and should always find a place in every apiary. This done, raise the back of the floor-board half an inch, because the combs should be built across the long holes in the crown-board, thus allowing the bees access to the supers from between all but the outer combs.

Having stopped the holes in the crown-board with a piece of cloth the swarm may be put in (hived in if got from a neighbor) and the hive then placed mouth downwards in front of the stand, not on it. Put a stone under the edge of the skep, and so let it remain until the bees have clustered in it. Then lift the hive carefully so as not to disturb the cluster and place it with the holes in the crown-board pointing east and west. As the entrance which points to the south is half an inch lower than the back the combs will be built from front to back across the holes. The swarm need not now be touched again for a week or ten days, unless the weather should be unfavorable for honey-gathering, in which case it should be fed with dry sugar.

If the weather be fine for a week or ten days a good swarm will have built combs nearly half way down to the floor-board, and unless super room is given every comb will be clogged with honey almost as fast as the comb is built, with the result that the hive, if left alone till the end of the season, would contain a lot of honey and a small quantity of bees. To super, place on the stock-hive, after carefully removing the cloth in the holes, so that the tender combs are not broken, a six-inch super with the holes in the crown-board pointing east and west. The super must be

made secure so that there is no escape of heat. These operations are best done in the evening, the bees being kept down by a puff of smoke, or by smearing the edges of the holes with a feather which has been dipped in carbolic acid. If the swarm be a good one, the season early, and the district a good one for bee-pasturage, the bees will quickly take to the super, and when it is about three-parts filled it should be raised and another placed between it and the stock-hive. Both these supers will most probably be filled with delicious honey, while the combs below will be one mass of brood. If the beekeeper prefer to have no bother with feeding he might be content with one super, when the stock-hive would as regards bees and honey by the end of the season be in a condition to winter successfully. When, however, it is found that after taking off the supers there is not sufficient food in the stock-hive to last the winter, syrup should be given as described in this *Journal* and the various bee books.

The swarm will be termed a stock the following spring, and the treatment it will require will be similar to that recommended for the swarm. But as our object in the spring will be to prevent swarming, the super should be placed on the stock-hive early, that is, when the hive is well filled with bees and when honey-gathering in quantity has commenced. But it must be borne in mind that the super must not be allowed to get more than three-parts full before it is raised and another is placed between it and the stock-hive. The upper super will be first completed and may then be removed, and the remaining one treated as was the super, first placed on the stock-hive. Thus treated the stock will most probably give a large surplus in the supers, and swarming will be prevented. If there should be a fear when the supers are on that a swarm will issue raise the stock-hive and supers bodily and place under all on the floor-board an empty super. This will be used as a brood-chamber, and at the end of the season the combs should be cut out and melted in order that the super may be ready for use the following season.

(To be continued.)

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THE

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VOL. III.—No. 1.]

SEPTEMBER, 1888.

[PRICE 6D.

Editorial.

OUR THIRD VOLUME.

WITH this number the *Australian Beekeepers' Journal* enters on the third year of its existence with a much increased subscription list, and encouragement from our readers on all hands. Our list, however, is not yet what we hope it to be, although during the past year it was almost sufficient to cover the cost of production, instead of, as the first year, leaving a balance considerably on the wrong side. We must again appeal to our subscribers and readers, and beekeepers generally, to help in increasing the circulation of this little periodical. We are very desirous sometimes to add a woodcut or two to illustrate and explain some of the subjects treated of, but we are scarcely justified in doing so with our present subscription list. The art of Beekeeping is largely on the increase in Australia, and especially in Victoria, and where three years ago there was one stock of bees kept on modern principles, there are now a dozen: factories for the manufacture of hives and apiarian appliances have been established in the principal cities, and are, we hear, doing good businesses, and there is a prospect of Beekeeping becoming an important industry in every district where nectar-bearing flora abounds. Our little Journal was initiated to help and foster this industry, to assist beginners, to give information to enquirers, to exchange experiences, to collect statistics, and to keep our Australian beekeepers informed of the progress of the art in other countries, of new methods, new inventions, and generally to serve as a beekeepers' newspaper. To carry out this programme needs the help of every experienced apiarian in the country. Constant com-

munications from beekeepers, and enquiries from beginners, and regular reports from owners of apiaries as to produce, sources of honey, local markets, conditions of stock, &c. Not only do we require all our beekeeping friends to be subscribers, but also contributors to our Journal.

The Beekeepers' market is now largely invaded by manufacturers of fraudulent imitations of honey, who cheat the public by making up mixtures of glucose and sugar, or starch or corn syrup, with a small percentage of real honey to more completely beguile the unwary. Tons of this are on the Australian markets, to the detriment of the consumers, and great injury to the beekeepers. It will be one of the aims of this Journal to thoroughly expose frauds of this kind, and to teach the public to discriminate between such imitations and pure honey, and to keep the market open for fair and honest dealers in the produce of the beehive.

HINTS FOR AUGUST AND SEPTEMBER.

THESE are, perhaps, the two most critical months for the beekeeper, for on the start obtained in these months will depend very much the success of the coming season. Stocks require careful management at this time of year. So soon as the days get a little warmer and the bees busier the spring examination should be made. Choose a warm day after middle of August, and see if stocks are right and possessing a queen. See also if there is food in plenty; if not, feed slowly. Sometime in frame hives where the combs on which the bees are clustering are empty, outside combs are still nearly full of sealed honey. In

this case take out one of the full combs and scratch or bruise the cappings so that honey just oozes out a little. This may be done by lightly scratching over the cells with stiff brush or hair comb, or, indeed, by rubbing them over with the flat side of a knife. A very little disturbance breaks or bruises the capping, and lets the imprisoned honey ooze out. Now part the combs in the middle of the cluster and insert this comb. The bees will soon set to work and remove it to the outer combs, and it the same time use it freely, giving a great stimulus to the queen and bees, the former at once fills the comb just emptied of honey with eggs, and breeding commences with vigour.

If there are no such full combs the bees must be fed with either honey or syrup. In either case it must be thin, that is, about 1½ lb. of white sugar to a pint of water, well boiled with a tablespoonful of vinegar. This should be fed with a feeder that will deliver it slowly to the bees. It makes a wonderful difference if we help bees a little just at this time. Don't add more frames till those the bees have wintered on are teeming with bees, for the closer we pack them until near swarming time the stronger they get. When the frames are running over with bees the dummy can be moved out and one or two more frames added, but do not give too much extra room at a time.

If hives are found queenless new queens should be given if possible; if not, the stocks must be united to another having a queen. A weak stock, with a queen, is better than a strong one for this purpose.

Of course during the winter months everything in the way of frames and hives have been got ready for the spring, all old hives cleaned, scalded and repainted. If not, lose no time in doing this, for you will find no time when swarming commences.

When looking over stocks examine carefully for any signs of disease, and when present make arrangements for putting bees and queen into a clean new hive, with clean combs, or better, frames of foundations. As soon as breeding is fairly under way, and honey coming in, all dirt or dust on bottom boards should be removed, and it is well to get new mats to cover the frames, for often the old ones get mildewed and dirty, and perhaps eaten through by the bees. After doing this much, the less we disturb our bees the better so long as we see they want no food and have their increasing demand for comb room supplied. To those interested in experimenting this would be a good season to try Simmins' new swarming system, which may easily be done in an ordinary Langstroth hive, where the bees have been

crowded on four or five frames, with a dummy, during the winter. This is the way:—If the frames are on the left side of the hive arrange that the entrance be on the extreme right of the hive, as far from the cluster as possible. Now, as soon as the bees want room, give them a frame or two of comb, until they have, say, seven brood frames; after they have got possession of these fill up to the right hand side of the hive with frames supplied with starters only. Now, as soon as the bees increase they will want more room, and begin to build comb in the outside frames, but when they have nearly filled these frames with comb remove them and put in fresh frames with starters, never allowing the frames to remain until they are quite filled. The frames taken out should now be placed over the brood nest in a body box placed above the brood chamber. Mr. Simmins states that the bees at once commence to store honey in the combs placed above, and if the bees are kept comb building between the entrance and the old brood nest on the left of the hive, they will have no inclination to swarm.

Although with the end of August we may count the winter as over, and bees will be busy on fine days, and pollen bearers be seen coming home laden with the produce of wattles, willows, and early flowering shrubs and flowers, still August and the early part of September is often a trying time in the southern part of Australia for bees, by reason of promises of spring and warmth being rapidly succeeded by cold streaks and squally weather, often resulting in heavy losses to stocks that are awakened to activity by a warm day or two.

THE EXHIBITION.

THERE are signs of beekeepers being pretty well represented in the Exhibition, although a blunder has been made in allotting space to apicultural applicants. It appears that several applications were made by individual beekeepers some time ago. Somewhat recently the Victorian Beekeepers' Association applied for space near an outer wall for exhibiting bees at work; this was granted, but when the early applicants came to look for their space they were informed that none had been allotted to them personally, as it was thought they would exhibit in the space allotted to the Association, so that several of the Victorian exhibitors will be crowded into the narrow space given to the Association.

There will be several exhibitors in the Victorian Court, and there is already a

goodly collection of hives and appliances. New Zealand, New South Wales, and South Australia will have exhibits, and probably other colonies will also have similar exhibits.

We propose to give an account of those exhibits in future numbers.

The exhibit of bees at work will be placed at the eastern wall near Nicholson-street in the Victorian court, but it is not expected that this exhibit will be in position till after the first of September.

MANUFACTURED OR SPURIOUS HONEY.

THE appearance in the Melbourne market of a large quantity of well got up parcels of so-called honey, and labelled *pure honey*, pure garden honey, &c., with the names of well-known firms appended, and which seems to have met with very general sale, has attracted the attention of beekeepers; first, by the fact that it remained fluid during the cold months, while most pure honey was solid and hard, and secondly, by a simple inspection of bottles purchased for examination; for the way it moves in the packages (generally bottles) at once betrayed a constitution differing from pure honey. On further examination this material was found to consist for the most part of *corn or starch syrup*, a substance largely made in America from refuse, maize, potatoes, &c., and consists of crude glucose and dextrin or gum. It is very cheap, not exactly deleterious, but certainly not wholesome. Many of the samples bought up by the Association contained certain percentages of real honey, and most were flavoured with some essence or other. The manufacturers had committed a flagrant breach of the 55th clause of the Health Act by labelling these packages as honey, and rendered themselves liable to a fine of £20 in every case. Since the attention was called to this fraud by the Victorian Beekeepers' Association, the same material appears in shop windows divested of the labels, the dealers expecting thereby to escape the provisions of the Act.

We notice the same thing is going on in the other colonies, and the New South Wales Beekeepers' Association, by the Agricultural Society, have determined to initiate proceedings in every case.

The remedy against this fraudulent manufacture is most strongly in the hands of consumers, but also to a great extent in the hands of beekeepers. The people want instruction with regard to honey. Only the other day a sample of splendid honey from Daylesford was brought to us by a purchaser

who stated "the Association should prosecute the vendor, as it was adulterated and almost all sugar." It was *solidly crystallized with the cold weather*, and when he was told it was pure and good honey he said it was "too hard for that." We ultimately convinced him, and he has advertised this pure commodity in every direction. The fact is the majority of the people look on crystallized honey as manufactured, and corn syrup as pure honey. It is a pity it is not generally known that nearly all true honey is solid below a temperature of 62° Fahr., and that what beekeepers regard as a test of purity and ripeness should be looked on by the public as the reverse.

So many people have complained of late of honey making them sick. This manufacture explains it.

Our American friends were the first to try this experiment, and we had in Melbourne not so very long ago a large consignment of Californian honey in the comb, called "Californian Sage Honey." This was true honey comb filled by the bees with corn syrup, which had been fed to them. It is a pity we cannot compel such beekeepers to eat all such stuff, or induce the bees to revolt against so dishonest a use of their labour.

COMB FOUNDATION AND FOUNDATION MILLS.

WE have received from Messrs. Dickens and Sons, Wakefield-street, Adelaide, some samples of foundation made by foundation mills of their own manufacture. The specimens are of several kinds, and are known as Natural Base, Dunhams, Roots, &c., according to the style of the impression, which form the base of the cell. Some has the flat bottomed cell impression, which has been much used for sections, and frames for comb honey. This flat bottomed foundation made thicker is now coming into extensive use in Europe for brood as well as super comb, for it is found the bees take to it as readily as any other form, and it appears it is more easily made than the other. Roots, Dunhams, and other forms of foundation have the natural base with circular walls and differ chiefly in the depth and thickness of wall. As foundation is now almost indispensable to beekeepers working for profit, we find several are setting up mills of their own, and we have had numerous enquiries as to cost, &c., which we have replied to as far as we could. To such as require further information in this direction, we would call attention to the Messrs. Dicken's advertisement in the present issue, and we hear from some of our

South Australian correspondents that excellent mills are turned out from seventy shillings and upwards. They are described as follows: The rollers are made of a special metal, a kind of hard pewter on steel shafts. These rollers are cut by a special machine driven by steam power, and produces highly finished work. The cell impressions can be cut in different forms. The frames of these mills are made of iron, and there is an improved device by which, directly one sheet is through, the bottom roller falls back from upper, so as to permit the end of the wax sheet to be started through without sticking, and returns to its proper position as soon as the handle is turned forward. All these mills have two pair of cut brass wheels, and proper adjusting screws for regulating the thickness of foundation. We tried some of the thin flat bottom foundation for sections rather late last season, many of which were thoroughly filled and sealed, the comb was the lightest and thinnest we ever had in comb honey.

Proceedings of Beekeepers' Associations.

VICTORIAN BEEKEEPERS' ASSOCIATION.—The monthly meeting of this Association was held in the Public Service Association rooms, Melbourne Athenæum, on June 25, at 8 p.m. Present, 16 members. The President, Mr. Ellery, in the chair. Minutes of previous meeting confirmed. Three new members were elected—Mr. J. F. Higgins, of Malvern; Mr. W. Barnes, Francis-street; Mr. Wm. Andrews, Collingwood; also one country member, Mr. Eli Jacobs, of Kyneton. It was decided that a stand should be erected at the site granted to the Association by the Exhibition Commissioners for the purpose of exhibiting live bees in observatory hives, Mr. Chambers to undertake the work under the direction of the President. There were placed upon the table 6 or 7 samples of spurious honey, manufactured and bottled by various firms and individuals in Melbourne, which proved to be fraudulent imitations, containing little or no pure honey. It was shown that the sale of this class of imitation is largely carried on in Melbourne and suburbs. There was present by request Mr. Field, analytical chemist, of St. Kilda, who showed to the members present an easy way to demonstrate the difference between pure honey and the imitations now before them the constituents of which were chiefly starch sugar and dextrine or gum, by the simple admixture of alcohol to samples,

which had been diluted with equal parts of water. After discussion it was agreed that the sale of spurious honey, contrary to the Health Act, be brought under the notice of the health officer by the President, and that he should also take steps to have this subject ventilated through the press. A vote of thanks was accorded to Mr. Field for his attendance and exhibit. The Acting Secretary gave notice that at next meeting he would move that a subscription list be opened to collect a sum of money to assist in the purchase of an annuity for the Rev. L. L. Langstroth, to join in the scheme now being carried out in America. Mr. L. T. Chambers exhibited sectional hive with shallow frames and dummy board. Meeting closed at 10 o'clock.

S.A. BEEKEEPERS' ASSOCIATION.

The annual meeting of this Society was held at the Chamber of Manufactures, on Thursday, July 25, Dr. J. A. Cockburn, M.P., in the chair. The evening was a very wet one, and very few attended.

The President mentioned that several new Associations had been established during the past year; namely, at Mount Barker, Williamstown, Kersbrook, and Mount Pleasant. The new Societies would, doubtless, sustain cordial relations with the parent Society. He alluded to the loss sustained by the Society and by the colony generally in the death of its late President, Sir R. D. Ross, whose place it would be impossible to fill up. The Foul Brood Act had been acknowledged, even by its opponents, to have been beneficial and conducive to the best interests of beekeeping. The annual report and balance-sheet was read. The report stated that important strides had been made during the past year in beekeeping, that every requisite in the industry is now manufactured in the colony, and that the business is large enough to maintain at least two firms. Four new Beekeepers' Associations have been established during the year—at Mount Barker, Williamstown, Mount Pleasant, and Kersbrook. Sixteen new members had joined during the year, and there had been a pamphlet issued upon "Foul Brood and its cure." The passing of the "Foul Brood Act" was alluded to with satisfaction. The disappointing nature of the last honey season was adverted to, and in reference to some serious losses through starvation it was "to be regretted that those who suffered loss from that cause were not more alive to the necessity for a close inspection of the food supplies of their colonies in a bad season." The extensive mischief wrought by the wax moth was noted, and attributed in a great measure to weakness in the colonies. It was recommended that meetings be held quarterly instead of monthly, and that on these occasions full programmes be provided. In view of the success attending the issue of a previous pamphlet issued by the Association it

was suggested that others should be published intended especially to instruct beekeepers in the management of bar-frame hives. The library has been increased by gifts from members as well as by the current magazines subscribed for, and which have been bound. The balance-sheet showed balance last year £3 2s. 3d.; receipts from all sources, £11 19s. 3d.; total, £15 1s. 11d. Expenditure, £15 1s. 5d.; balance in hand, 6d.

The Hon. Secretary reported receipt of a number of returns of operations by beekeepers for the past year. Several stated they had experienced heavy losses from foul brood, but generally had cured it by Muth's method, and the bee moth was reported as being very destructive. In the hills districts particularly the season for honey had been very poor, many large apiaries returning no honey whatever. One report from Brighton gave 5 hives at commencement, 8 at finish, with 500 lbs. extracted honey, chiefly from carobs and eucalypts. Another increased from 8 to 14 colonies, and got about 140 lb. comb honey and 560 lb. extracted. Another increased from 2 to 4 colonies, took about 56 lb. each of comb and extracted honey, from eucalypts and garden shrubs. One commenced with 12, increased to 15, sold one, and took 100 lb. comb honey and 700 lb. extracted. One took 2000 lb. extracted honey from 6 hives, commencing with 7 and selling 4 during the season. Another reported 11 colonies at beginning of season, 15 and 14 nuclei at end after selling 5 full colonies, took 307 lb. comb honey chiefly from 4 colonies, and 1213 lb. chiefly from 6 colonies. Another commenced with 3 hives, finished with 8, and took 400 lb. comb honey. All of these yields are reported from beekeepers upon the plains around Adelaide, or in Adelaide and its suburbs.

After votes of thanks to officers of the past season, the elections for next year were made—the President and Hon. Secretary declining to stand again. Mr. C. F. Clough was elected President; Messrs. F. Randell and A. Molineux, Vice-Presidents; Messrs. T. Hubbard, C. Dickens, sen., H. H. Dollman, and W. C. Blakett, committee; Mr. C. G. Gurr, Secretary; and Mr. S. Randell, Treasurer.

In moving the adoption of the report, it was stated, amongst other matters, that the incoming season appears to be very promising, as the encalypts all over the colony are full of flower-buds. It was doubtless due to the poor season last year that the interest in the doings of the Association had somewhat slackened. Although foul brood had been prevalent, it was not as bad as it would have been under the old system, as it had been cured in most cases, and there were enquiries from all quarters as to the mode of cure, which in itself was a hopeful sign.

Mr. A. E. Bonney then read a paper on "Hives and Bees," which was as follows:—

"I think that nearly all of us who have learnt beekeeping by reading and studying books on the subject have noticed that at times when we try to put into practice some operation described it does not prove so successful as could be desired.

At any rate this has often been the case with me, and I have found it necessary to modify the rules laid down in order to adapt them to my requirements. And there is nothing surprising in this when we consider that most of the best works have been written in England or America, where the climates are so different to ours. In the following short paper I propose to point out two or three of the appliances or operations that are recommended for those countries, but which are not suitable for this. The hive being the most important appliance required in beekeeping, I will speak of that first. Experience has proved that the hive invented by Mr. Langstroth, and which bears his name, is the best suited for us. Unfortunately the tendency of modern times, both in England and America, appears to be to complicate this hive by the addition of many labour-saving devices that may be of use in those countries, but which I have found worse than useless. What we require is a simple hive consisting of as few parts as possible, and so constructed that it can be readily taken to pieces for examination or cleaning. The chief reason for this is evident; it is due to the fact that every beekeeper in South Australia must be prepared to deal with foul brood, and in treating this disease where bees are kept in such hives as I shall describe presently, the labour is not much more than that involved in the ordinary spring cleaning as recommended in many books of apiculture. But to attempt to eradicate foul brood from an apiary consisting of Berlepsch, Heddon, or other complicated and expensive hives would require more energy and perseverance than is, I am afraid, possessed by the majority of us. The hive I recommend is simply a box made of seven-eighth inch pine without top or bottom, and having a rabbit in each end piece to support the frames. The top and bottom boards are loose and made exactly alike, excepting that the bottom board is three inches longer than the hive, so as to give an alighting board for the bees. An entrance is cut three-eighths of an inch high and the full width of the front of the hive, which will give ample ventilation in hot weather. In winter this entrance is reduced by the use of the ordinary triangular blocks. The frames should be perfectly plain, with a stout top bar at least half an inch deep, and should rest upon a strip of tin or hoop iron to prevent their being fastened with propolis. A piece of enamel cloth to cover the frames completes the hive. This simple and inexpensive hive obtained in the flat from the manufacturers can be put together by any one who is able to use a hammer, and will give just as good results as the most complicated hive I have as yet tried. At harvest time a second story exactly similar is placed on top of the first, or if comb honey is required a case of section boxes is put on instead, but in either instance the top board of the hive covers the whole. This is the hive I began beekeeping with seven years ago, and am still using at the present day. I have imported from America and England several of the best hives advertised, and have given them a thorough

practical trial in my apiary, but they have all been laid aside in favour of the hive described above. With me it is essential that all combs are readily moveable at any time, whereas in many modern hives this important feature appears to have been lost sight of or sacrificed for the sake of introducing some novel idea. The next question I propose to deal with is—Can more honey be obtained in a season from a single colony of bees that is prevented from swarming or from one that is allowed to swarm? That is to say, is it better, where honey is the object, to reduce the increase of colonies to a minimum? In England and in the Eastern States of North America swarming occurs just before or simultaneously with the honey season, consequently in those countries it would seem that the best results should be obtained by preventing swarming. This is just what most English and American books advise, but it will not apply to South Australia, or at any rate to such places as I have had experience of. Here in ordinary seasons bees swarm naturally in September, and the honey harvest does not begin until December some three months later. It has been proved that a worker bee must be about 35 days old from the egg before she is of use as a honey-gatherer, and from this it is easy to show that at least two months are required to enable a small swarm to become a strong colony. But as a rule they have three months in which to get ready for the honey harvest, so that there is ample time allowed them. Now, if two or more swarms come out of one hive, and are supplied with laying queens, there is no reason why each should not give as much honey as the original hive would have done if swarming had been prevented. Of course, the apiarist must see that no colonies are so reduced by swarming that they cannot protect themselves from the bee moth or other pest, and he must be careful to keep all well supplied with food. In view of the uncertainty of bee forage between the swarming and honey seasons, it is preferable to increase the colonies by artificial swarming rather than leave it to the natural instinct of the bees. It is simply marvellous the rapidity with which a mere handful of bees will build themselves up into a large and populous colony. This is due to the suitability of our climate to the honey bee. The last question I shall refer to is whether the frequent handling of bees is injurious to them? I remember reading an article in the *Town and Country Journal*, written by a correspondent who had been on a visit to an apiary near Brisbane, in which it was stated that the beemaster condemned the frequent examination of bees, and pointed with pride to one of his hives that had not been opened during the season. This is perhaps taking an extreme view of the case, but most authorities on beekeeping advise that bees be disturbed as little as possible, and then only when it is absolutely necessary to do so. I may say at once that I cannot agree with this, for my own experience has been that the more care and attention bees receive the better they will be for it, and the larger the amount of honey

they will yield. Of course it must not be supposed that I think the bees or the beekeeper would gain by any aimless opening and shutting of the hives. But the point I wish to make is this, that in order to keep our bees in health, and to turn their energy to the best account, it is necessary during the honey season to make frequent examinations of the hives. It is chiefly owing to the facility the moveable frame hive gives for making these examinations that renders it so much superior to the common box hive, for it permits the beekeeper to see at once when anything is going wrong, and enables him to supply whatever is lacking. Unless bees are working in section boxes, I would advise that all hives should be inspected once a week during the time honey gathering is going on, always provided the weather is favourable. Besides the advantage of keeping the hives in good working order, it will be found that the continual handling of the bees will tend to greatly improve their temper, and even cross hybrids will in time become quite pleasant to deal with. Some years ago when the Chamber of Manufactures imported a colony of Ligurian bees, and handed them over to my charge, I felt that it was a responsibility, and demanded all my care. Almost every day for several months I used to examine that hive, and made a point of never closing it without finding the queen, so as to be sure she was safe. The bees began to look upon these visits as a matter of course, and showed no signs of disturbance when the hive was opened. Whilst holding a comb in my hand some of the workers would fly off to the fields, whilst others would return with loads of pollen and honey which they would deposit in the cells. The queen would continue laying eggs, and in fact the whole work of the hive would go on just the same as usual. During the season this hive was most fruitful in honey and bees, and although I have had many good colonies since none have given me a better return, and certainly none have ever had anything like as much attention bestowed upon them. In the introduction to Quinby's "New Beekeeping," we are told how "a good old man warned Mr. Quinby against his habits of study and examination into everything in and about a beehive, and said, 'Your bees will never do anything if you potter with them so much.'" This occurred more than fifty years ago, and the success which attended Mr. Quinby's efforts in beekeeping has certainly proved that in his case the old man's advice was wrong. I believe you will all agree with me in saying that the more care and attention we give our bees, and the more we potter with them, provided it is done in an intelligent manner, the better will be the results obtained, both for pleasure and for profit."

A long discussion followed, in which it was stated that in this country the bees often swarm prematurely, and if then hived it is necessary to feed them for a month or more, because there is not sufficient honey flow, and that if this is not done the swarms may die of starvation. Many amateurs were too fond of handling their hives,

and were too free with the use of the smoker. Some members objected to the bevelled joint upon the top and bottom of hives, preferring the plain edge. Mr. Bonney, in replying, recommended members to feed back the "dandelion" honey, as it was too strongly flavoured for sale, though wholesome for the bees. To a member who recommended that the entrance should be cut in the bottom board, he said that this made it difficult to clean the hive. A member in reference to ants said that he had not been troubled with ants ever since he had given up trying to defeat them by placing the hives upon vessels of water. He believed the water attracted the ants.

News and Reports from Colonial Apiaries.

VICTORIAN BEE COMPANY.

In our last number we referred to the formation of a Bee Company at Hamilton. Since then we have received a prospectus. The Secretary and general manager is Mr. Delnot, and the apiary manager Mr. H. Naveau, our esteemed correspondent of the Western District. The capital is £2000, in 2000 shares of £1 each, over 800 of which which have already been taken up. The name of the company is The Victorian Bee Company, and the apiary will be situated in the heart of the mountains near Dunkeld, and on the banks of the Warrior River, an excellent district for bees.

BULN BULN, GIPPSLAND.

The past season has been very bad in this district, the cause being too much rain, and hardly any flowers; and, worst of all, *foul-brood* to fight against, it being very hard to deal with. I have tested carbolic acid, and find it the best cure for it. I use pure white, crystal carbolic acid, one-eighth of an ounce to a quart of water, sprayed twice or three times a week on the frames. I have used this mixture for my hives and find it not too strong. My bees are now fine and healthy except one stock that was nearly rotten at the beginning of the season, but is now getting quite clean.—R. Hastings, Buln Buln, Gippsland.

ITALIAN BEE FARM, PARRAMATTA, N.S.W.

Report of Season 1887—SS.

Now when the bees are prepared for their winter's rest, and the most necessary work is done, it behoves the beekeeper to close his year book and make out his report.

Last year I stated that in my opinion a good season might be expected to follow, and that I was nearly right in my prediction my following report will prove:—Although, perhaps, everyone will not be satisfied, still I hope that the greater number of beemen will be pleased with the past year's harvest; at any rate, my friends from all parts of N.S.W. acknowledge this in their letters sent to me. Accordingly I came to the conclusion that this was a good season.

I wintered 240 colonies, all pure Italians, and they were all found in good order by my first revision in spring. The winter was exceedingly mild, and very rainy, but as the bees do little work during this time in fine weather it matters not whether rain or no rain. Peach flower was a failure, as there was none, and other fruit trees supplied very little. But the orange flowered extra good just around Parramatta, while the weather suited pretty well for honey gathering. The bees found plenty of nectar from these blossoms from the middle of September to the end of October, and 3000lb. could be taken without in any way shortening the stores required for coming times. This honey is very much liked by the consumers, and fetches a high price. Little honey was stored, except by strong stocks, after the orange blossom was over. The tee-tree flowers generally in December, but it being so wet there was none of this honey stored, and as this is the worst honey we get here I am not sorry. In January the weather became clear and fine. The eucalyptus opened soon its nectaries, and the bees had a steady but not too generous honey flow until the middle of May. Honey extracting could be proceeded with almost every day, and our honey product for this season amounts to 21,000lb., of which 2000lb. is in 1lb. and 2lb. sections. I had no desire to get more sections, or else a greater quantity could have been filled. Gum trees were about the first to flower, with apple tree, stringy bark, box, &c., following. All this season's honey is of good quality, but as plenty was produced everywhere the market is stocked and the river low.

Swarming commenced in September, and finished in October. Only about fifty swarmed from the whole of our stocks, although I never prevented any hive from swarming once, while after-swarms were hindered altogether. Some, who keep hybrid and black bees, informed me they increased to hundred and more per cent. If the orange blossom did not yield so much honey as it did perhaps my bees would have swarmed more, but as it was they decreased breeding and forgot swarming, through their

greater desire for honey gathering. Four and five frames could be taken from the broodroom of my hives full of honey in October, and some had the honeyrooms full also. I may here mention that one-half the number of my hives have the honeyroom half the size of the broodroom; the other half have the honeyroom just the same size as the broodroom, where I can use 42 1-lb. sections, or 10 large frames, while the 2-lb. sections are used in the low honeyrooms.

The demand for stocks of Italian bees was nearly in accordance with the increase; to make up for the others I made some artificial swarms. Now we have again 240 stocks in good order and condition.

It is not my custom to leave all the honey in the hives until the season is over; nevertheless the hives had to be cleaned and all examined before wintering, as well as some more surplus honey removed after the close of the honey flow. Here I found the greatest care must be taken to avoid robbing, and I was glad I had no more honey to take. I also found that the honey was tough and extracting difficult. It would be very acceptable if someone who takes all the honey after the season is over should state how he managed it.

The New South Wales Beekeepers' Association is now about a year old already, and I do not remember having read any reports thereof. Now, if there is no one else to let you know of such an occurrence, I do not see why I should not, although I consider myself the least fit for a reporter.

Their objects are: The encouragement and advancement of beekeeping and the prevention of importation, manufacture and sale of adulterated honey. Of the first meeting I knew nothing at all. At the following meetings rules were drawn, presidents and committee men selected, and proceedings were to be taken against anyone who makes honey out of sugar, &c. Beemasters were to be appointed to instruct other members, &c. I undertook to read a paper on these subjects at the third meeting, thinking what a lot of good this may do. I pointed out how difficult it is to prove adulteration of honey, and of how little use a travelling beemaster would be (there being plenty), and how great the cost would be. I mentioned that we should first of all supply a better article than the adulterated was, and we should make it convenient for the consumer to get it. Well—. The fourth meeting went as smooth as butter, and I noted that the good therefrom would at least do no harm. For the fifth meeting I promised to read another paper, this time, to protect my hive from disgrace,

when it so happened that there was no quorum, only a few new members wished to join, and liked to hear what I had to say, as they use the same hive as mine. At the following meeting this paper was tabled again and read, not to everyone's satisfaction I think; but to be sure someone said that all hives were bad, whether hive or box, as long as they had frames inside! It was also arranged to give prizes for twelve 1-lb. jars of extracted honey, for twelve 1-lb. sections, for six 1-lb. sections, for large frame of honey (any size), for small frame of honey (any size), for best Italian queen, with bees, in observation hive, for best black queen, and for honey bees at work, together with implements. The money was to be given by the Agricultural Association. Next time the Government Analyst gave a very interesting lecture on adulteration of honey. He analysed a lot of samples sent to him for this purpose, and found some pure, some adulterated; but, he said, adulteration with some kind of sugar is difficult to detect, while wax and pollen found in honey was a sure sign of its purity, as if these matters could not be mixed with almost anything sweet. It was, I think, decided not to take action just then, but the lecture should be printed, and as far as I understand about such matters, it seems that the adulterator may learn as much as anyone from the lecture, provided he does not know all about it already. Nevertheless, it is as good an instruction as any how to feed bees with sugar, which is such a favorite method with many, and considered as good as boiled honey anyhow. I wonder if an analyst would state the same; if so, then beware, you gincase fanciers, who heat your honey to get it out of the wax before sending it to market. An action may be brought against you at any time. But the frame hive keepers heat their extracted honey too to keep it liquified.

For a good many months I have heard no more, and no meetings have been held, so I could not give you any more report. I hope the little infant has not sickened, or if so, I wish speedy recovery.

On the Hunter River another Beekeepers' Association was formed soon after the other. I have read several reports, and judge therefrom that they mean business. They are willing to assist one another, and to learn one from another. Their district is a splendid one, and I do not see why they should not make good progress. In fact, they have done well, as I judged from their exhibits at the H.R.A. Show.

It would be a benefit to the members of such associations if they could have reports of their meetings, in which case the far away

member would know what is going on; and if all were of my opinion, I would suggest they should correspond with this Journal, and have full reports given. The Editor would hardly object to enlarge his paper if he gets 30 or 50 or 100 more subscribers. That each colony should have its own Journal is very patriotic, no doubt, but—

It pleases me to hear of the continuance of the publication of this Journal. Fresh risked is half won.

W. ABRAM, MANAGER,

Italian Bee Company, Parramatta, N.S.W.
July 4th, 1888.

[NOTE.—We should be very glad to get an account of the Association meetings in N.S. Wales, and we will promise full reports if the secretaries will furnish notes. Perhaps Mr. Abram may prevail upon the Hunter River Association to communicate with us.—Ed.]

Correspondence.

No. 62.—I beg to bring under the notice of your society the wholesale destruction of the bees in the forest of this and other districts, and would suggest the necessity of a close season to protect them. The bees are robbed at the wrong time from ignorance or indifference, and the industrious insects are turned adrift to perish.—I am, &c.,

JAMES GLOSTER.

Seymour, July 3rd, 1888.

No. 63.—Taking advantage of a warm day last week, I had a peep at my bees to see how they were getting along for food, &c., and was much pleased to find that a good deal of honey had been gathered and sealed over during past few weeks. Although we are in the middle of winter, and all the queens laying more or less. Some queens having brood in three or four frames, most of them with brood in two frames.

I have one colony which fairly astonishes me by their working capabilities. They very rarely cease work. If it is possible to fly at all, shine or not they are at it. When there is not another bee to be seen, I have counted them running in 60 to the minute, at 8 o'clock, when everything was dripping wet from fog and dew. The queen in the hive was raised from an imported mother, but without any sort of care being bestowed upon her. In packing a colony for a customer, finding one frame broken, I simply left it behind with the adhering bees, and these raised one cell, which hatched out in due course, and I then strengthened the hive with another card of brood. The bees are mixed in marking, but the quietest bees to handle in the yard, and, as I have said, are most energetic in working. The original mother was a splendid queen, and I have often regretted parting with her, as all her

stock proved good. I have here plenty of forage, so that when the sun shines warm for a few hours there is a merry hum comes up from the apiary.

A letter from Witherswood apiary, received last week, informed me—"All hives clobber full of honey." As extracting ceased end of March, this has been gathered since. I would much rather have it here in section boxes, and hope that next season, with my shallow frames, to remedy this. Anyhow, the bees will get a good set-off for the spring, and the present honey be turned into good swarms of bees.—Yours.

L. T. CHAMBERS.

"Comella," Middle Brighton, June 9th, 1888.

Extracts from Foreign Journals.

OPEN VERSUS CLOSED-SIDE SECTIONS.

From "*Roots Gleanings in Bee Culture*,"
April 1st, 1888.

DURING the past four years I have used perhaps 15,000 open-side sections without separators. For six years previous to this time, I used the ordinary closed-side sections, so I can speak from experience of the merits and demerits of each style. I started out about ten years ago with the double-tier wide frames, with tin separators. In comparing the work of colonies in top stories filled with these wide frames of sections with the work of similar colonies in similar top stories filled with large frames of comb or foundation for extracting, it was evident that the supers for extracting had some strong point in their favor. Even when both frames and sections were furnished alike (with comb or foundation), and other things being equal, almost two pounds could be expected in the large frames to one in the sections. We naturally look for some practical difference in the conditions which could cause this difference in results, and we notice those three impassable partitions running from side to side and from top to bottom of the one super, caused by the closed sides of the sections.

At some person's suggestion I tried removing one of the central frames of sections, and placing in its stead a comb for extracting, thus breaking through those partition walls. This proved to be quite an improvement. I decided that bees like large frames better than small ones. A neighbor of mine was using large 2-lb. "California" sections without separators, and with only a small scrap of comb as starter. He got as nice comb honey, and more of it, than I did with my expensive separators and extra work. In 1882 I changed to 2-lb. sections and adopted a ease to hold them, similar to the old-style Heddon case, only with three apartments instead of four.

I believe those large sections were entered more promptly and filled more rapidly than the smaller ones; but, not mentioning the common objections to large sections, our object was not

yet fully accomplished. A new start must be made in each separate apartment, or cross-row. "Bait" combs could not well be used as an enticement, for it will not answer to place a section filled with comb by the side of one with only a starter, without a separator, which could not be used in this case; and if we have comb in all the sections of one cross-row it does not serve as an enticement for any other row, as there is no direct communications between the rows.

In 1883 I conceived the idea of opening up communication between these cross-rows, by making entrances between the sections at the sides, like those at the top and bottom. I accordingly went back to the 1-lb. section with open sides, and contrived a case especially adapted to their use which has since developed into what I now call the "adjustable" case. The chief object of this change was to combine the advantages of large frames with those of small sections.

One important advantage is, that after work is once started anywhere in the case, the bees gradually work through in the next row, and on to the ends of the case in the direction the combs run, which is the natural way for bees to work: whereas with the closed sides, work must be started in four places, and then progress "across the grain."

Another advantage claimed is that of a more perfect ventilation, facilitating the ripening process. Practice proves that the objects sought are realized. The main object is the same as that sought by the many expensive and complicated contrivances under the heads of "reversible frames," "contraction dummies," "invertible hives," and "divisible brood-chambers" with the queen-excluders, which these things necessitate. In brief, it is to get honey stored in sections rather than in brood-combs. With full 10-frame L. brood-chambers, without contraction, inversion, or queen-exclusion, but with open-side sections above, I have found throughout a good honey-flow, the queens holding their position up close to the top-bar, leaving always plenty of empty cells below and around the brood. From such colonies I have had good yields of comb honey with but few swarms, and at the close of the season I have found scarcely honey enough in all the ten brood combs to winter the colonies.

I do not claim that the use of open-side sections will give us *all* the advantages claimed for contraction and inversion; but with them there is not the necessity for the unnatural extremes of compulsion, to which many are now resorting.

The unfavorable reports from open-side sections are evidently the result of improper construction, poor workmanship, or the want of a suitable case to hold them. They should be pressed close together, especially from the ends of the case; and for easy manipulation the case should be capable of enlargement.

OLIVER FOSTER.

Mt. Vernon, Iowa, Mar. 5, 1888.

THE REV. L. L. LANGSTROTH.

From "*British Bee Journal*," May 24th, 1888.

THERE is, perhaps, no man living to whom bee-keepers of the present day owe more than to the Rev. L. L. Langstroth, or, as he is termed by our American friends "Father Langstroth." How often in the progress and development of a science or industry the pioneers, those who were amongst the first, and who worked the hardest, very soon became forgotten. It is so in bee-keeping; those who have done the most, and by their exertions have enabled many in the present day to become not only bee-keepers but successful honey-producers, are forgotten and ignored. But this is not all, for those who have benefited by others' brain efforts and experiences are frequently those who do their best to crush them. Do we not find repeatedly that claims are made to inventions and improvements without regard to what has been done before? Names of inventors, discoverers, and benefactors are frequently forgotten in the eagerness to benefit at their expense. We might mention numbers of instances at the present day, where inventions are used with but slight alteration, and the users deriving a pecuniary benefit, whilst the originators, to whom the invention cost a large expenditure of brain power, many sleepless nights, and perhaps a large sum of money into the bargain, are completely ignored. We have a most striking instance of this in the case of the Rev. L. L. Langstroth. We do not wish to enter into the question of whether Langstroth, Munn, or anyone else, was the first to invent the frame, but what we wish to point out is that Langstroth was the first to make the moveable comb hive a practical success, and by his work, *The Hive and Honey Bee*, which is still the standard on the subject, he opened up to the world the improved methods of bee-culture, which have led to the enormous success witnessed at the present time. Does every bee-keeper realise that in using a moveable comb hive he is morally indebted to Mr. Langstroth for the benefit he is deriving from it? And if he does, is he prepared to make some acknowledgement and return for this obligation?

For many years Mr. Langstroth, who is now 77 years of age, has suffered, and only from time to time, and at long intervals, has he been able to take up with his favorite pursuit. We regretted that when we visited America last summer he was not in a condition to see us, and nothing would have given us greater pleasure than to have grasped this veteran's hand and looked into his benevolent face. Ever devoted to the science he loves so well, according to a friendly letter we received from him a few days ago, he was even then, during a period of convalescence, at the apiary of Mr. Heddon studying the capabilities of the Heddon system. His head troubles have prevented him from earning his living, and it is because this master of bee-keepers has been robbed of his means of livelihood by some of those who have reaped the

benefit of his labours that he is not now, in his old age, in comfortable and independent circumstances. From time to time small sums have been subscribed, and in 1879 'The Langstroth Fund' was started in America. In that year Mr Newman visited England, and at a meeting of the British and Foreign bee-keepers, held at our residence in Horsham, a subscription was started which amounted to about 6s. 6d., the whole amount collected here and in America barely reaching £40. Since that time small sums have been remitted to him, but how out of all proportion is this to the benefits conferred by him on the world! It is now proposed in America to raise a sum of money in order to purchase an annuity, and every bee-keeper there will have an opportunity to pay some tribute to his great leader.

But why should we stand aloof and do nothing? On another page our correspondent 'Amateur Expert,' in his pathetic appeal, says, 'Let us, as British bee-keepers, give practical expression of brotherly feeling by subscribing to the fund! it will only stimulate his countrymen to do more, and make the annuity the greater.' These sentiments we heartily approve, and think it the duty of the many who have benefited by Mr. Langstroth's labours to do something on his behalf, so that this good old man may pass the remainder of his days in comfort, cherished by the thought that there are noble and honest minds on either side of the Atlantic that do appreciate his efforts, and prove a brotherly love and feeling are ready to recognise them. We shall be pleased to open a subscription list to be called the 'Langstroth Fund,' and earnestly hope that our appeal will be heartily responded to. Let us bear in mind that 'he giveth twice who gives in a trice.'

COMB HONEY.

THE BEST METHOD FOR OBTAINING A GOOD ARTICLE.

From "British Bee Journal," June 7th, 1888. [1870.] As the time is at hand for obtaining comb-honey, a word about the methods to be employed may not be amiss.

No doubt shallow frames without comb tend to drive the bees into the sections; but, at the same time, the queen must be suppressed in her duty, namely, to keep the colony supplied with brood; for where there are ample vacant cells, the queen is sure to increase even beyond one's expectations. I believe that I first gave the origin of my own plan a number of years ago, which is in full harmony with the instincts of the bees.

As the queen will only use comb $\frac{3}{4}$ of an inch thick, it must be shaved down to that depth. Now where there is much honey in the comb, it is to be extracted. But the combs must not be left, as it generally is, say, $\frac{3}{4}$ of an inch or so apart. They are to be closed up to at least $\frac{3}{4}$ of an inch, and by using strips of wood $\frac{3}{4}$ x $\frac{3}{4}$, with a large-headed tack driven in the edge $\frac{1}{4}$ of an

inch from the top (the strip is half the length of the end bar to the frame); these are now hung on the tin rest, and the frames crowded against them, one at each end of the frame next the side of the hive, and so on. At last they are hung between the division-board and the last frame, and all crowded up close. Thus the frames are all spaced alike, and we can move the hives, and yet all is secure. Thus close, the bees cannot bulge much of the comb, and the queen is sure to use the natural thickness, which she has plenty of, and the bees are glad to enter the sections.

I am sure, too, that we need less comb in this way, and yet we are sure of more brood. I got nine frames into a hive only $11\frac{1}{4}$ in. wide. With even this number the bees will work in the sections far better than in the old way, when crowded down on five or six combs, spaced away apart by bulged and thick comb. Such was sure to cause swarming, as instinct plainly teaches the bees that they must soon be unknown if no brood-room is provided; and how often we have found but little brood where there should have been an abundance, and yet the cause never occurred to us. This shoving and narrow spacing also prevent storing of pollen in the section to a great extent, simply for the reason that there is plenty of room right among the brood, where it should be. Where one has a large quantity of colonies, there is a great saving in the comb, which is quite an item.

Of course for winter the combs are spread, and a 'stay' like the above only $\frac{1}{4}$ of an inch would please any one when he comes to move the hives into and out of the cellar, as they are simple and cheap, and remain nicely in place. Try it.

After trying about every method, I have proved the above plan to be the one. Also that it pays to use full sheets of foundation in sections, and to cover the boxes up warmly, and then rest assured if there is honey in the field, it will be carried into the sections.—E. P. CHURCHILL, Hallowell, Me.—*Eastern Farmer*.

INCREASE.

METHODS OF OBTAINING COMB AND EXTRACTED HONEY, &c.

Read at Nebraska State Convention.

BY J. M. YOUNG.

Knowing the interest taken in the advancement of bee-culture, I improve this opportunity of making a short report of my labors in that direction. The honey-crop of last season was considerably below the average in this part of the State, and in certain parts an almost total failure. The fall crop was very light, owing to the continued drouth during the summer months.

Fruit bloom and the early blossoms of white clover put the bees in good condition, and kept them so until swarming; but they secured only enough nectar from these sources to build up

rapidly, and not enough to store any surplus. White clover proved nearly, if not quite, a failure in this part of the country, as far as I know.

About June 20th. there was a fine flow of honey from the basswood blossoms, which grow abundantly on the banks of the Missouri river, and all along out water-courses. This flow lasted two or three weeks, when it ceased, leaving the bees with well-filled hives and a fair surplus stored in the sections. The balance of the season furnished the bees only enough to keep them in good condition, and keep brood-rearing under good headway.

The present condition of bees in general is very good, with the exception of late swarms, which will starve long before spring. My bees, which are being wintered on the summer stands, began the winter with all the conditions favorable, the colonies being strong in numbers, and having an abundance of well-ripened honey.

During 13 years' experience in apiculture, I have always practiced out-door wintering. By actual test and experience in this matter, I long ago arrived at the conclusion that bees wintered on the summer stands successfully, must have protection against the extremes of temperatures of cold winters of Nebraska. The bees wintered with proper packing, invariably came through the winter stronger in numbers, build up more quickly in the spring with less dwindling, and better in condition to receive the harvest than those in single-walled hives standing side by side.

The inventory of my apiary at this date (Dec. 31) shows that 75 colonies out of 96 are packed in chaff on the summer stands, and if my experience is anything like it has been heretofore, I do not expect to meet with any unusual losses in wintering.

MAKING INCREASE BY DIVISION.

While dividing colonies for increase is preferred throughout the country by a large majority of bee-keepers, I practice and prefer in my own apiary, "natural swarming," from the fact that apiculture is my sole occupation for a livelihood, and I work the business for all that is in it.

If the bee-keeper has plenty of time and extra combs, with which to supply his divided colonies, he will without a doubt succeed with this method. I will say this in behalf of dividing colonies, from the fact that I do not wish to be understood to say that bee-keeping cannot be made success financially without it, viz :—

If increase is the bee-keeper's object, and he has plenty of comb foundation already drawn out, and plenty of money in his pocket, by all means use the dividing method of increase. On the other hand, my experience has enabled me to arrive at the conclusion that *natural swarming* pays best, if dollars and cents is the object to be sought.

The question might be asked, how do you control swarming? I do not always do it, but then to a certain extent I do. Just soon as the bees begin to show symptoms of swarming I put

on the sections, and keep the bees supplied with plenty of room, never allowing them to be idle if there is honey in the fields. In a few days after the first swarm issues, I open the hive from whence the swarm came, and remove all queen cells but one, if there seems to be no newly hatched queen present.

Some apiarists may claim that bees will swarm too much, but my experiments in that direction have proven to the contrary. From 76 colonies, spring count, I obtained only about 30 swarms altogether, for the season of 1887; and in summing up all my reports from year to year, I cannot find one instance whatever of doubling my number of colonies by natural swarming.

Dividing colonies is a safe way to increase, and can be carried to almost any extent; and while I have said so much against it, I could not well dispense with this new improvement in bee-culture; for it is by this means that all my nuclei colonies are formed, and queens reared.

COMB AND EXTRACTED HONEY.

Now a few words as to my method of obtaining comb and extracted honey. The apiary is worked for both comb and extracted honey, from the fact that there is to be found in any apiary a number of colonies that do not feel disposed to work in surplus sections; whenever colonies of this kind are found, they are supplied with an extra set of combs, and by this means they can be induced to store a fair surplus of honey to be extracted. In this way a portion of my apiary is "rigged-up" with two sets of combs, for extracting purposes. When honey begins to come in fast, these combs are placed in the extractor about once a week (or just as often as necessary) and the honey taken out. I seldom disturb the lower story in extracting.

The rest of the apiary, being composed of all strong colonies, is supplied with sections whenever necessary. When one case is partly full, it is raised and an empty one placed under it. My favorite section for obtaining comb honey is the $4\frac{1}{2} \times 4\frac{1}{2}$ inches. I use two widths, namely, the $1\frac{1}{2}$ -inch and the 2-inch. Which width is the best I am not prepared to say.

My market demands a section that holds a pound of honey; sometimes I get this pound in the $1\frac{1}{2}$ -inch section, and oftentimes in the 2 inch section. My judgment, based upon experience, is that a section which will hold as nearly as practicable one pound of honey, is what the trade and market demand.

In conclusion, I will state that the season's work for 1887, summed up in a nut-shell, is not an encouraging report by any means. After uniting a few late swarms in October, I began the winter with 96 colonies, having had 76 colonies with which to commence the season's work. My sales of comb and extracted honey amounted to upwards of 1700 pounds, about 1500 pounds of which was produced during the last summer. The comb honey was disposed of at a good price. Extracted honey has had only a fair sale, but I am glad to say that the demand is increasing.

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THE

AUSTRALIAN

BEE KEEPER'S

JOURNAL

EDITED BY

R. L. J. ELLERY AND

J. H. KITCHEN.



Melbourne :

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NOTICE.

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Editorial.

THE Editors have to apologize to the subscribers and readers of *The Australian Beekeepers' Journal* for the delay in the issue of the present number, which has been unavoidable. They trust they will be able to issue more punctually for the future.

HINTS FOR OCTOBER AND NOVEMBER.

Is almost all parts of Australia beekeepers find that they are in the midst of their busiest time, by the latter end of October, if not earlier; swarming will be the order of the day, and the constant attention of the Bee master will now be required.

One of the first matters to be attended to is to see that every hive in which brood is being reared is well supplied with food, for it must be remembered, that colonies that are not very strong have such heavy demands on the population to keep up the temperature of the brood nest, that comparatively few bees can be spared for foraging, and so we frequently find in such hives that although well stocked with brood, little or no honey is found in the combs, even when strong colonies are carrying in more than they require, and on storing it as surplus. See therefore, that all breeding colonies have plenty of food, weak ones at all events should be fed unless there is plenty of honey in the combs, and if the honey flow is poor, or the weather cold, wet or impropitious for them, don't hesitate to feed the strong colonies also if they run short of stores; starving bees at feeding time, or indeed keeping them without a plentiful supply is the worst thing a beekeeper can do, for without a populous hive no honey can be stored, and a stock short of food quickly stops increase, and in many cases cannot be stimulated to rapid breeding when once they have been checked by scarcity of food. In October and part of November at least this is a most important point in

Beekeeping. Unless honey be given as food, white sugar syrup made as directed in the earlier numbers should be given freely but not too rapidly. We cannot lay too much stress on the wisdom of helping colonies all we can, throughout the early part of the breeding season, and even later if necessary. Our best surplus honey is often got after the middle of January, and all hives that are not strong at the first or Spring honey flow, should at all events be helped and encouraged so far as to be strong for the later Summer and Autumn harvest.

We gave in our last number several hints with regard to the management of swarming, and we now propose to say a few words about securing honey in comb or for extracting.

Many bee-keepers complain they cannot get their bees to work readily in section boxes, put on as supers; this is by no means an uncommon occurrence, even with strong and good working stocks, and is the ordinary course with weak ones. It is no good to put section boxes over bees that are not sufficiently numerous to fill every comb in the hive and sometimes we find stocks which will store honey in every comb in the brood chamber so that the Queen has no room to lay an Egg rather than take any upstairs into the super, but such bees can be made very profitable by a little watching and management; take out several, say four of the outside combs that are filled with honey, push the other combs towards the sides, so that you have room in the centre of the hive to replace the combs removed by the empty ones, if there are any on hand, or else extract the honey from those removed, and then place a couple say in the centre, and one on each side of the hive. The Queen will commence to lay in the empty combs in the centre and the bees store honey in the outer ones; in a day or two remove more outside combs and extract, placing another empty one in the centre and one on each side, in this way such stocks will often store a large quantity of honey during the season.

But about supering with section boxes, we find the best way to proceed is to make up one

super of the usual number of sections with starters, or full sheets of foundation, but the central row should be filled with clean comb with a little honey in it. (some partly filled sections of the last season are useful for this) and if honey is coming in you will find your bees filling in the sections at once. If no comb can be obtained it will be better to put into the centre of the super only 2 or 3 rows of section boxes, and cover them and the open parts over the side frames with a warm mat; the bees will often take to a few sections snugly covered, when they would refuse to enter a super full of boxes with only starters in. Beekeepers will find however, a decoy comb with a little honey in a wonderful help in getting our little friends to commence storing upstairs.

Many beekeepers experience a difficulty in getting their sections off the hive on account of brace combs, this is chiefly due to the space between the tops of the frames and the bottom of the section boxes being too little or too great; if too small the boxes are glued to the frames by propolis, if too great brace-combs filled with honey are the result, and in either case it is difficult to remove the sections. The proper space to allow is a bare quarter (3-16) which will be generally kept pretty clear of both comb and propolis. A proper crate for sections should rest on the frames at a few points only, and a clear full 3-16 space be left between the bottom of sections, or of the crate slots everywhere else. If this is done the trouble complained of will be reduced to a minimum. If crates are not used some form of honey board by which the exact space named is provided for will do equally well. If supering with deep or shallow frames instead of sections, the same precautions as to the space above the frames in the brood chamber must be taken, and it will be wise to use some kind of honey board, with full 3-16 of an inch between it and the frames, both below and above. We were very successful last year in getting our bees storing early in super frames, for extracting by simply putting the central frames full of clean comb with a little honey in it, and we are certain the result pays for the trouble ten times over.

Careful watch should be kept for any appearance of foul-brood, and timely action taken at the first signs. The various methods of treatment have been fully described in the earlier numbers of this Journal, but our own experiences leads us to advise the "begin afresh" method, *i.e.*, shaking the bees off the combs, and from the hive into a box or hive, and from thence into a new or clean hive supplied with new frames with starters only. Before shaking off the bees remove the hive from its stand some little distance away, putting the new hive with frames and starters in its place. After the bees are in their new hive they must be fed freely with good syrup either with or without a little silicic acid or phenol, until they have stored enough food to keep them going.

SPURIOUS AND ADULTERATED HONEY.

The trade in spurious honey is still carried on to a great extent, although a little more cautiously; the same vile compounds which were gaily labelled "Pure Garden Honey," or "Pure Honey from Orange Flowers," "Pure Meadow Honey," &c., are still exposed in shop windows, bereft of their lying labels so as to avoid the penalties under the 35th clause of the Health Act. Not only is this glucose and corn syrup imitation largely offered for sale, but is extensively bought for its cheapness, and, during the cold weather, because of a popular notion that all crystallised honey is adulterated with sugar, and that the beautifully labelled fluid corn syrup, which does not crystallise, must therefore be pure honey. Fraudulent imitations and spurious manufactures require both rogues and fools to render them profitable.

Already one or two prosecutions have been carried out by the authorities, but failed because the right delinquents were not cited. It is to be hoped, however, the next action taken in this direction will be more successful.

Some amusing correspondence has taken place lately in one of the Melbourne papers, *The Evening Herald*, in connection with this subject; and we find an analytical chemist who reports, in support of one of these "Bogus Honey Bees," that he took as a standard *pure Californian honey in the comb*. It was his standard of purity—*pure comb honey*—and because it contained a large proportion of glucose, assumed that pure honest honey always did so. Poor fellow! he must be very simple to take imported Californian comb honey as his standard of purity. If there is a game some exporting Californian's understand, it is the one of feeding bees on pure pale corn syrup at the time when the true honey flow is falling off, and so inducing them to store it in their combs for export to the heathen Chinese and the little less heathen Australian, and so supplying a real standard of pure honey for our unsuspecting analysts. Let our analytical friends try the samples in the polarescope, and condemn every sample that is *right-handed*, whether it comes from Californian comb honey or from anywhere else. A simple chemical analysis of honey is a complex and ticklish job, but the detection of a large adulteration with glucose or corn syrup is easy and certain enough.

While on this subject we may refer to an article in the New Zealand bee paper, the *Australasian Bee Journal*, of September, which deals with the article on "Bogus

Honey" in our own journal of June, and blames the beekeepers of Victoria for their apparent supineness on the subject. From this article we should assume that this luxurious compound has not yet made its appearance in New Zealand, but the onward march of commercial enterprise will scarcely miss the chance of a good corn syrup market among our Eastern brethren unless pure honey gets cheaper than it is. The writer blames the Victorian beekeepers for not accepting his offer, made some time ago, to examine samples if sent to him in New Zealand. But no examination was necessary. Beekeepers knew that spurious honey was being sold in Melbourne, but had no power to stop it, or do anything until it appeared labelled as honey. Then and only then could they take action, which they did at once, and that so effectively that nearly a ton of this jam factory honey was removed from a large retail store next day to the "Home of the bogus honey bee," the manufacturer, and very soon it was difficult to buy a bottle of the new nectar, or to see one that was not divested of its label.

Still, so long as there are unscrupulous manufacturers and ignorant purchasers, the trade will go until a good *shocking example* is found and someone heavily fined. All the beekeepers can do is to keep public attention constantly called to the true facts of the case, and educate consumers to discriminate between honey and its dishonest and unwholesome imitations.

A statement has been copied into nearly all the European bee papers respecting some honey obtained from a bee tree in Tasmania, and which was said to have a strong flavour of, and possess the same medicinal properties as, eucalyptus oil. Now, although experts can distinguish honey gathered from eucalyptus by its aroma and flavour, we have never heard of any that tasted of eucalyptus oil, except when it has been artificially added, as is done with the patent jam factory orange flower, or lemon flower, or pure garden honey. It is highly probable, therefore, that some of the produce of the bogus bee has got into the European market. This seems more probable, as one of the English bee journals speaks of honey "with a strong flavour of eucalyptus oil" as having come from Australia.

for this purpose, such as calico, hessian, and other kind of bagging cloth, matting of various kinds, and so on. Many American and English beekeepers use enamel cloth or "American leather," as it is sometimes called. We tried it some time ago over a weak colony, which afterwards died out with dysentery. The loss was attributed to the enamel cloth cover, which is impervious to moisture, and which becomes quite wet from the deposit of moisture within the hive, and so we discarded this material.

In the account of the South Australian Beekeepers Association, given in our last number, we find Mr. Bonney, the talented and well-known Adelaide apiculturist, stating as follows:—"A piece of enamel cloth to cover the frames completes the hive."

We wrote to Mr. Bonney on the subject, asking certain questions on the subject, stating our objections to the material, and giving our experience of its use. Mr. Bonney replied as follows:—"I may say I do not know of any material equal to enamel cloth for covering the frames of a bee hive during the working season, *i.e.*, from after swarming till the end of summer, but I would not think of using it in winter, having found, as you have done, that in cold, wet weather, it causes dysentery. In winter I cover the frames with several thicknesses of newspaper, and find that this answers very well. Formerly I used pieces of flour bagging, but now prefer the newspapers. I cut the enamel cloth the full size of the inside of the hive, and use it with the enamel side downwards. In some colonies the bees will eat away the edges of the cloth where they droop over the two outside combs, and it is then necessary to use wider cloth so that it will rest on the side of the hive. I always use enamel cloth over supers, and think it most important. For summer use I like the cloth; it is so easily cleaned, and lies nice and flat on the frames. In winter, whatever material is used to cover the frames, I always allow an air space of at least $\frac{1}{4}$ of an inch between the frames and the cover."

We have used the enamel cloth on some of our hives since the breeding season has well set in, and so far appears to be all that can be desired. If the enamel side is up, the cover gets very damp, but it cannot do so if the enamel side lies on the frames.

MATS FOR COVERING FRAMES.

Mats or squares of some kind of cloth are nearly always placed on the tops of frames in hives, both as a means of keeping bees on the frames as well as for maintaining warmth. Various kinds of material is used

Proceedings of Beekeepers' Associations.

VICTORIAN BEEKEEPERS' ASSOCIATION. — A meeting of this association was held on Monday evening, the 24th of September, at Public Ser-

vice Association rooms, Melbourne Athenaeum. Twelve members present. The president—Mr. Ellery—being in the chair. Most of the time of the meeting was occupied in discussing the manufactured honey question, and it was ultimately decided to prepare an exhibit of various kinds of honey alongside samples of the corn syrup imitation, with the view of as far as possible instructing the public as to the relative appearances of pure and manufactured or adulterated honey. The following new members were elected:—Mr. Thomas Dean, Brighton; Mr. B. Watson, South Yarra; Mr. W. Brown, "Romsey," Clifton Hill; M. A. Crawford, Department of Agriculture; Mr. D. Harrison, Benalla; Mr. W. Schnelle, Wahgunyah; Mr. T. Sumner, Great Western. The Secretary opened a subscription list on behalf of the Langstroth fund in accordance with the notice given at the previous meeting, and members subscribed as follows:—Mr. L. Chambers, £2 2s.; Mr. Ellery, £1 1s.; Mr. Jos. Clarke, £1 1s.; Mr. Ingamels, 10s.; Mr. M'Laine, 10s.; Mr. Lloyd, 10s.; Mr. Andrews, 10s.; Mr. Sallows, 5s.; Mr. Baldwin, 10s.; Mr. Field, 10s. The secretary offered to accept a first swarm of bees as value for 10s. subscription to the fund. Several present intimated their intention of subscribing in this way.

News from Colonial Apiaries, &c.

NANGEFLA, CASTERTON.

Mr. M'Pherson reports from this district, dated 13th October:—No swarms, drones about. Supered eleven hives working tremendously and rapidly filling the sections. I shall want to double super almost at once. Saw drones first on 14th September. Extra room in time, has, I think kept down swarming, which cannot now be long delayed. In September bees were gathering from elm, poplar, willow, blue-gums, fruit trees, rosemary, light woods, rib grass, brown caper weed, etc. Bluegum (*E. Globulus*) still flowering very freely.

TALLAROOK.

Mr. Chambers reports having received from Mr. Pedlin of the Mount View Apiary, Tallarook, some parcels of white and yellow box in bloom, which he says would "make any beekeeper anxious to let his bees have a try at: it is full of bloom and full of honey."

ECHUCA.

FROM Echuca East Mr. Willyan reports, 24th September, as follows:—"I have had my first swarm to-day (splendid yellow bees they are too), and will have another to-morrow. I have sections ready for sealing, and altogether this seems to be so far a promising season. I have had some bad attacks of foul brood, and have been successful in curing it by Muth's method, also by Cheshires, but I am now going to try M'Laine's method. . . . I have spent many hours spraying combs with carbolie acid, for if done properly I have always found them safe to use.

OUR OWN APIARY.

THE first swarm came out on 9th October from an Italian stock, since which time swarms have issued on almost every fine day.

One stoek—whose queen is the daughter of a Cyprian queen imported eighteen months ago—hatched last season, and mated with an Italian drone, having filled up a large super, sent out a heavy swarm on October 13th. These bees are the most vigorous workers we have seen, are the gentlest bees in the apiary, and have shown themselves exceedingly hardy. On opening the parent hive three days after the swarming to cut out queen cells, two young queens were caught above the frames, and twenty-four queen cells were cut, two of which hatched out immediately. The Cyprian blood shows itself unmistakably in the production of such a large number of queen cells. These bees have one troublesome peculiarity, when opened up they run abut the frames like frightened hares.

No foul brood has shown itself this season, and we hope the persistent use of Muth's method (minus the starving) we adopted throughout last season has cleared our apiary of this pest for the time being; we used no carbolie or salicylic acid or any other drug all last year, and believe the success attained is due to putting our diseased stocks in clean hives with frames of starters only, and keeping them comb building while fed on plain syrup with salt added.

There has been a plentiful honey flow, and all the stocks have stored heavily; so far the season about Melbourne and the suburbs has been excellent for the bees.

BEEKEEPERS' SUPPLY COMPANY'S FACTORY.

Mr. Chambers reports, on October 16th, as follows:—We have been flooded with orders during the past few weeks, and are passing out goods for all parts of the Australian colonies. Everyone wants goods in a hurry. Consequently the workshop becomes slightly congested, but we hope to worry through although we cannot well avoid giving disappointment to some who have failed to order earlier in the season.

Good reports come from all directions, every prospect of a plentiful yield this year.

MR. PRICE'S STEWART'S RANGE APIARY.

Mr. Price reports as follows:—

NARRACORTE, S.A.—I am pleased to report a better state of affairs from this part of South Australia than that furnished from around Adelaide. My last report was dated, I think, October. About 1st October, 1887, I had 13 colonies, and these increased by end of December to 24, giving 1000 lbs. of extracted honey. The last fortnight of December was quite an exception to the usual run of things, for no honey at all was coming in. Brood rearing was in full swing, and by the last few days of December the hives had not an average of three pounds of honey in them, as I had been keeping the combs empty to meet the demand for honey. The "prickly box" came in just at the critical point when every hive had a swarm of robbers round it, and

soon every colony was busy and happy again brood rearing and storing honey. As the honey was unsaleable, I got as much as possible converted into beea by extracting the top combs as clean as possible, and putting two or three of them at a time down in the centre of the brood chamber, taking out the outside ones and those already capped over and putting in top story to make room for them. By this means I had all hives "boiling" over with bees, when the ti-tree and stringy-barks come in to bloom in the latter week of February; indeed they were so populous that about the middle of March, notwithstanding that I extracted every week, all made preparations for swarming. Some seven hives sent off the largest swarms I ever had, and in order to get as much honey as possible I extracted every particle of honey from the hives they issued from, made a nucleus of the bees that had been left behind, and hived the swarms on its own combs. Luckily a week's rainy weather set in, and all that had not swarmed tore down their queen-cells, and turned their energy to honey-gathering. The flow lasted till the end of May, when the cold weather put an end to the season. By the end of the season I had 33 hives, and had sold three tons of honey and had 1000 lbs. put by for feeding. I had now to shift all my bees to their new quarters. (Stewart's Range), a distance of nine miles, roads rather rough, and as all were very heavy, and most had the top stories on, some trouble had to be gone through to pack the frames tight. This was done by making the required number of cleats, (four to each hive), and made rake-fashion to slip down at the ends of top bars, a strip of perforated tin over entrance and roof, and bottom boards secured, completed this job. Now all are busy on the head-flowered white gums, which are in full-blossom, and all promise a fair return for the trouble.

Correspondence.

AN EXPERIENCE WITH A SWARM.

No. 64.—A swarm issued on October 9, and in accordance with your recommendation in your hints for September page, I adopted the following plan:—After the swarm was settled, I moved the parent hive A to another stand, hived the swarm in a new hive B with three frames of brood from the old hive and two frames of empty comb. Two days after this new hive B sent out a swarm, evidently led by the old queen, which this time was moved and placed on another stand, where they are now working hard. Although the swarm was large, there appeared to be plenty of bees left in hive B. The plan I adopted is not only referred to by your editors, but recommended by several writers on bee-keeping. Now the question is—Is this plan a good one if it is open to such a result as I have had? The object of my using this method was to prevent further swarming, of course all queen cells but one being cut out

from hive A four days after swarming. Why did the old queen lead out a swarm again? She laid eggs before swarming, for the bees were found making queen cells, in which eggs could be seen the day the swarm issued. Was anything done wrong or omitted in the course I adopted?

SIGNA.

Extracts.

ARE BEES WORTH KEEPING?

(By CHARLES DICKINS.)

In some form or other the title of this article will probably be crossing the minds of many of our readers at the present in prospect of starting bee-keeping in the forthcoming spring-season. This subject can be viewed from so many and so distinct points that, commencing with such a wide basis, the enumeration of a few of the subjects of interest may prove pleasant as well as profitable. First.—We have the man who keeps bees for pleasure, eager to possess himself of a new race; anxious to try any fresh invention, and apiculture to such a man is a hobby. But this aparian is of great use to the cause, as money being no object, his facilities for testing novel ideas enable others to know if this or that appliance possesses any real merit.

Secondly.—We have the experimentalist, who loves his bees as a study, ever striving to advance science and acquire some fresh knowledge concerning the natural history of these most industrious insects, useful in a thousand ways to man. In these ranks from age to age have been found men who have devoted their lives and fortunes to the cause, teaching us the anatomy of the bee, pointing out the wonderful adaptation of this part of the insect for certain work, and that part for the advancement of the wonderful economy in nature, showing us the loving forethought of the great Creator who fashioned all things, however simple or complex in their construction, for an all-wise purpose. From such men we have the habits of bees, their diseases and cure, the methods of collecting honey, and their power of transmitting pollen from flower to flower, insuring the fertilisation of blooms, providing for us a larger harvest of both grain or fruit than could have been obtained without their instrumentality. Thus true philanthropists have given to the world the results of their tedious experiments and laborious observations.

Thirdly.—We have the agriculturists and fruitgrowers, who keep bees, not with the primary object of obtaining honey or because they are particularly fond of beekeeping, but because they have learned from the experimentalist that no bees mean no fruit. It is now becoming a recognised fact that where fruit is cultivated to a large extent and bees are not kept in the vicinity, an apiary must of necessity be added to the garden; and profiting from the experience of our bee masters, these apiaries have

been made to yield profitable results in honey harvests.

Fourthly.—We come to the class who form the greatest number of beekeepers, viz., those who keep bees to increase and help out their incomes; these are recruited from all classes of society, and we are glad to see the cottagers profiting by the experience of their neighbours. To this fourth section of those who keep bees a few words of advice may here not be out of place. If you wish to make your bees pay, and if you intend them to succeed, conduct your apiary on strictly commercial principles, leave the proving of new ideas to those who can afford it, and have the time: depend upon it if they are worth anything you will soon hear of it. In the present day, by the aid of the various publications on the subject, you can with patience reap the experience of others' experiments. Be careful: but do not have a hive because it is inexpensive, such may prove "cheap and nasty." Bees are wonderful architects, very precise and exact in their work, requiring the interior arrangement of every to be exceedingly exact in measurement. If made with too much space between the side of hive and the movable frames, the bees will build comb between the two. If too little space is left it will be filled by propolis which will also become a great objection to the beekeeper when requiring to remove any of the frames to find the bees have fixed them tightly (by either comb or propolis) to the sides of the hive. Take full advantage of comb foundation, and do not neglect feeding when necessary, as such a principle would prove false economy.

Fifthly and lastly.—We come to the man who makes beekeeping a specialty, devoting his entire time and attention to their management, making apiculture his sole source of income, either by selling swarms and queen raising, or by working his apiary exclusively for the production of honey; or else, when circumstances permit, he may include all three in his scheme.

We have thus briefly traced the five different reasons "why people keep hives;" from which it is easy to reply that bees are worth keeping. As a hobby and a study, the pursuit will ever bide; but as a source of income the industry must ever continue to advance. Large apiaries are the rule in America and Canada, but with our exceedingly favourable climate such undertakings should be greatly adopted by us. Honey is steadily taking its right place as a household requisite; it was, of old, considered man's proper food. Some authorities inform us that Pythagoras, the philosopher, used to be contented with honey and the honeycomb and bread.—*Mildura Cultivator*.

BROOD COMBS—SOME PRACTICAL POINTS BY DR. C. C. MILLER.

HOW MANY CELLS TO THE INCH? HOW THICK
ARE THEY? HOW LONG DOES IT PAY TO
KEEP THEM, ETC.

On page 898, friend Root, you straighten me up as to the size of worker-cells, for which I am

obliged. I had Cheshire's book and the A B C for authority. Let me, then, amend the figures, counting 24 cells to 5 inches. At that rate there are 26.6 cells to the square inch, so that it will be nearer the truth to say there are 27 cells to the square inch than to call it 25. In order to make foundation which should contain 25 cells to the square inch, we must have 4.65 cells to the inch, or cells of such size that $23\frac{1}{4}$ cells, side by side, shall measure 5 inches. These are not matters of the greatest importance, but we may as well have them nearly correct.

THICKNESS OF WORKER-COMB.

How thick is it? I have been very unfortunate in my search, or else the books are very silent upon this point. Dzierzon, in his book, calls it about an inch in thickness, and Prof. Cook in his Manual says, "The depth of the worker-cells is a little less than half an inch." I think in general it is considered about $\frac{1}{2}$ of an inch, as nearly as I could tell with a common rule. Then I measured one, black with many years' service, and it measured a full inch in thickness. In the first case the division wall was a very thin affair; but in the old comb was an eighth of an inch in thickness, the additional thickness being made up of successive layers left by the many generations of brood. This difference in thickness, along with some other things, makes me think it possibly worth while to reconsider the question.

AT WHAT AGE SHOULD BROOD COMBS BE RENEWED?

I had laid this upon the shelf as a settled question, saying that I had used combs 25 years old, and could see no difference between bees raised in them and bees raised in new combs. But if, in the course of years, a lining is left in the cells sufficient to increase the division wall an eighth of an inch, may there not have been a difference in the size of the bees raised that would have been noticed by a more careful observer? Not long ago a writer in *The Ladies' Home Journal* advised, if I remember rightly, that brood combs more than two years old should be renewed. Undoubtedly that is rather wild advice; but in the *British Bee Journal* for November 10, 1887 (and the *B. B. J.* is not addicted to giving wild advice), occurs the following:—"We may fairly suppose that three batches of brood are hatched from the same cells—taking the broad nest only—in every season. In five years, therefore, we shall have fifteen layers of exuvie in these cells, provided they are not removed by the bees, which experience seems to prove they are not. The brood-cells, consequently, are much reduced in size at this age, and the bees reared will be small in size. We have used the same combs for fifteen years without a break, when the brood-cells become so diminutive that the bees hatched therefrom were a pigmy race, and the combs were as black as Erebus, and pollen-clogged. This was before the days of foundation. With our present advantages we do not think it profitable to use combs longer than four or five years." Dzierzon, in his book, page 28, says,

"The more frequently a comb has been used for breeding, the darker will be its color and the thicker the walls of the cells, the latter becoming more and more narrow and less and less fit for use, so that in time it becomes necessary for the combs to be renewed, although in case of need the bees themselves partly remove the casings, or even pull down the cells entirely."

Now, I suppose there are a great many like myself, with combs by the thousand more than four or five years old. We do not want to have the trouble and expense of renewing all these; but if there is any gain in it, we must do it. Although some of those things have somewhat shaken my former views, I confess I am anxious not to be convinced that it is necessary to remove combs four or five years old, and will be obliged for any facts that may stiffen my faith.

Looking at the old comb an inch thick, and pulling it an inch apart, I find it has a division wall made chiefly by the successive deposits left by the brood at the bottom of the cell these deposits in each cell being about a sixteenth of an inch thick. If such addition were made to all parts of the cell walls, the cells would be each one narrowed about an eighth of an inch, making the cell less than half its usual diameter, and it is easy to believe that bees raised in such cells would be a "pigny race." In the comb under examination, however, I find that the addition is only at the bottom of the cell—at least the addition to the side wall is very trifling. Is this the general rule, that in old comb the bottom of the cell is gradually filled up, but that the diameter of the cells remains practically unchanged? If this be the case, then perhaps we may conclude that the only matter necessary to consider, as combs grow old, is to see that sufficient additional space is allowed between combs to make up for their increased thickness. Is anything further necessary?—*Gleanings in Bee Culture, Aug., 1888.*

FEEDING NEW SWARMS.

If feeding must be resorted to (and of course it will be necessary unless there is plenty of forage in the fields) let it be done as follows: The first day or two feed a thin syrup, say one pound of water to two pounds of sugar, and place it, if possible, at the top of the hive (over the combs) and not at the entrance. If your hive has a cap, a small tin pan, or any dish that will hold one quart or three pints, will do as well as a *patent* feeder. Make a small hole in the honey-board, or whatever covers the frames, and place the vessel containing the syrup in such a way that the bees will have easy access to it. I usually make a bridge of a block of wood for the bees to climb over to the dish. To prevent the bees from drowning, thin pieces of wood which serve as floats are placed in the syrup. A strong colony will remove two quarts of the syrup in one day—yes, in a few hours. If thin, it is more likely to induce comb building.

After the first few days not over one pint of syrup should be given each day.

Now we will consider that the colonies have been queenless three days, and at this stage a queen should be introduced to each. It can now be safely done by merely smoking the bees with rotten-wood and letting the queen run in at the entrance.

Making colonies, as above described, is intended to apply to operation after July 20, and from that to August 10. While colonies can be formed after the last date given, it is not safe to make them, as there is not time for a sufficient quantity of bees to be bred up for winter. I have known swarms to issue as late as September 10, and to get nearly stores enough for winter, and in some cases such colonies have wintered well. Yet the wise beekeeper will not divide his colonies much later than August 10.

Beginning earlier in the season, as many as eight colonies can be made from one, and Mr. P. R. Russell, of Lynn, Mass., has been successful in doing so.—*American Apiculturist.*

DRONES—HOW TO GET THEM LATE IN THE SEASON.

In my queen-rearing experience I have seen times when I would willingly pay one dollar per hundred for some pure Italian drones; in fact, I am quite sure I have been obliged to pay out more than that sum to obtain them, counting the express bills and car fare I have put out the money for. A good many years ago, when about everybody lost their bees in winter, and when there were but few Italian bees in the country, I had but one *pure* Italian queen and a handful of bees to commence the season's work with. Well, it was up-hill work, but I managed to do a heavy queen business that year notwithstanding the discouraging outlook in the early spring. That was the season I had need for drones. It was necessary to keep the only breeding queen in a full colony in order to obtain drones as well as eggs for queen cells; but later in the season, when the old lady had made up her mind that she had mothered all the males she thought necessary for that year, she refused to deposit more eggs for that purpose. Well, I was in a bad fix, yet it was necessary to do something and that quickly, as the supply of drones on hand would not last long, and others must be had, or queen-rearing must go to the walls for the season. This prompted me to experiment. Though all the bee-books and authors tell us that young queens would not lay drone eggs the first year, I thought they could be made to do so. In this opinion I was right. I had a colony that had just made a set of queen cells, and as they saw the need of drones, the idea struck me that the bees had as much to do with the needs and desires of the colony as the queens. So I arranged a plan by which I forced the young queen to deposit her first eggs in drone cells. This is how I did it. The bees were removed from one of the best colonies I had, all the combs, save

one, were placed in the hive again, the centre or middle comb being left out, and a nice, clean frame of drone comb was placed directly in the middle of the brood-chamber. I then placed the queenless bees in the hive, and gave them a fine, young queen, one of the brightest golden Italians I could find in the hundreds of nucleus hives in my yard. In a few days I opened the hive and drew out the frame of drone comb, and to my surprise and great delight, I found that nearly every cell had an egg in it. The comb was then removed to a colony rearing queens, and the drone eggs were welcomed and nursed by the queenless bees. Another frame of drone comb was placed in the hive with the young queen and more drone eggs were obtained, and thus the supply was kept up for the season with little or no trouble.

I believe nearly all the bee-books contain the statement that young queens will not deposit drone eggs the first year of their existence. This statement is handed down from one author to another, not one of them knowing that such is not the fact. Very few authors of bee-books have had experience covering all points in bee-keeping, hence the reason why wrong statements and quotations are made and go the rounds.

One other experiment to obtain drone eggs resulted in a failure. I really supposed I had so arranged some combs that only drones could be reared, but the little rascals were too smart for me and my plans were upset. An old queen and several quarts of bees were placed in a hive having six frames containing drone comb only, and I supposed, of course, that the bees must rear drones and nothing else. I watched the process day by day and had the satisfaction of seeing an egg in most of the cells; the little worm or grub was nursed, and finally the cells were sealed over, but not as drone cells are usually capped with a projecting round cap; the capping was as smooth on the face of the comb as any worker brood, and worker brood was all the cells contained. Well, I was beaten, disappointed and disgusted, as well. Just then another idea struck me. I began to think I had hit upon a plan to rear worker bees as large as drone bees. The workers hatched in due time, but they were no larger than any other bees, and I had the labor for my pains, except the results of the experiment to pay me. Some one will say "why didn't the bees rear drones the same as in the first case given?" The reason is this: The bees used in the first experiment had been queenless several days, while the bees used in the last experiment had not been. Does the reader see the point?

No one can know these things without actual experience and well conducted experiments. We must experiment or be governed by theory. I like to go to the bottom of all such things, and then when a statement is made, the actual facts are at hand to back them up. No author should make statements that he is uncertain about. A standard work on any subject should contain actual facts and those founded upon experience. —*American Apiculturist*.

WHERE SHALL PARTLY FILLED SECTIONS BE KEPT? ALSO BROOD-FRAMES FILLED WITH HONEY?

There are at the present time several hundred of unfilled sections in our apiary. Just where to keep them has puzzled us for some time. They will be placed on strong colonies and tiered up about six sections or cases high, and protected from the weather. The bees in a strong colony will preserve the combs from the moth, and also keep the uncapped honey from souring in at least 250 sections. Possibly, the bees may remove the honey from all the combs; if they do, so much the better. Later in the season, if there is a good flow of honey, the cases can be replaced again on the best colonies. The advantage of this plan is this:

If a set of sections be left on each hive the combs will be badly discolored by so much travelling over them, and the bees clustering upon them. By the way, I hardly think the combs are discolored by the bees travelling over them, nor can I explain just what does give the white combs a yellowish cast; yet it does not seem to me that the bees do it with their feet. When tiered up, as suggested above, but few bees will be in any one of the sections at any one time. —*American Apiculturist*.

HOW MANY FRAMES TO A HIVE?

It used to be thought that ten L. frames were about the right number for a hive 14½ inches wide. But now eight frames, Langstroth size, are considered sufficient, or about the right number. None of the hives in the Bay State apiary have over eight Langstroth frames and several have but seven frames, and I think I get the best results from the latter. Not only do they build up more quickly in the spring, but they are somewhat on the system of contraction without contracting any hive for the purpose. I am positive that the 7-frame hives winter better than those having eight or more frames. Then it has sometimes seemed to me that there are more bees in a 7-frame hive than in those having eight or ten frames. —*American Apiculturist*.

GETTING BEES OUT OF SECTIONS.

Several cases of sections were removed from the hive just before sunset and placed in the bee-house. A cage containing a queen was nailed in a box and the box was then inverted on the cases which were standing on one end. In the morning every bee had left the sections and most of them were quietly clustered on the queen cage; the box was then placed out of doors, the queen cage removed and the bees returned to their respective hives. Had it been convenient or desirable to form a new colony just then, the bees could have been utilised for that purpose.

I find the bee-house, having but one room and so built that no bees can enter or get out through cracks in the door or window, one of the best places to put the sections when removed from the hive. I have a window in the door of my

bee-house: the bees leave the sections, and cluster thereon to get rid of them and at the same time let no robbers in, the door is opened and the bees take wing with a rush. Any room arranged as above will do as well as a house for that special purpose. The best methods for keeping comb honey, as practised by the largest beekeepers has been described in the back numbers of the *Apiculturist*. I think it would be best to get all honey in the hands of the consumer as soon as possible after it is removed from the hives.—*American Apiculturist*.

FINDING QUEENS.

HOW TO PROCEED WHEN LOOKING FOR THE QUEEN.

(Written for the *American Bee Journal* by G. M. Doolittle.)

Many seem to be troubled in finding the queen, not a few writing me to that effect, and asking how I proceed in that work.

One of the most important things to be remembered in looking for a black or hybrid queen is, not to use too much smoke so as to get the bees "crazy," so that they will run pell-mell all over the hive, and even outside of it: for with such a state of affairs no one is very likely to find the queen, and the hive might as well be shut up without trying.

Go to the hive and remove the cover as quietly as possible, so as not to disturb the bees the least bit, if you can do so. Now as the quilt is raised blow the least bit of smoke under it, and after it is removed keep for a moment or so blowing just a little smoke on the guards as they poke their heads up over the tops of the frames—just enough to turn them about again and no more. In this way you will soon have all quiet and nice, no running or anything of the kind.

Having thus brought them into subjection you are ready to proceed; but before doing so, I wish to say that there is a proper time of day to do this hunting for the queen, and that time is governed by the way the hive is placed or faces. As my hives all face south, we will suppose that we are in my bee-yard, and in such case the time will be at from 11 to 12 o'clock. Now, why this? Simply because at this hour the sun shines so as to obliquely strike the east side of the combs, as these run with the entrance to the hive.

One other thing: As the sides of any queen are much more yellow than her back, a queen is much more easily seen when looking obliquely on her, than when looking squarely on the comb or on her back, and as she walks about, while looking at her in this manner her abdomen is sure to attract our attention, thereby causing us to see her when we would not otherwise do so. Having explained this matter so, I think, all will understand it, we will take out the first frame next the east side of the hive, standing or sitting on that side.

For various reasons I prefer to sit down when hunting for the queen, chiefly because it brings the eyes in a more natural position for seeing over the combs.

To get the first comb out, if the hive has not a movable side, commence four or five frames away from the side next to you, and with a heavy knife or screw-driver loosen the frames, pushing them a little from you so as to gain room to lift out the first one without injuring the bees so as to irritate them. Whenever the bees come up on the frame-tops in a threatening manner smoke them a little, gently as at first, thus keeping them in subjection, yet at no time give enough smoke so as to thoroughly frighten them. A little experience along this line will enable one to handle even the most vicious hybrids without stings or getting them excited.

Having the first frame liberated, gently raise it from the hive, looking over the side next to you as it comes out, for the queen, and as soon as it is out look over the other side, by looking down obliquely from the top. Having made sure the queen is not on this frame, put it down outside the hive, or have another hive to place it in. In time of robber bees the hive is best, throwing a sheet over it to keep the robber bees off this exposed comb, but at all other times I put the combs on the ground outside the hive.

Now remove the next comb and as quickly as it is out of the hive glance down the face side of the comb next to you in the hive, and if the queen is on that side of the comb you will surely see her, for her first impulse is, upon the light striking her, to get on the other side of the comb, and in doing this she shows herself to a much better advantage than she would if she kept still, the sunlight making her appear "as natural as life and twice as big."

As soon as satisfied that she is not there, look on the other side of the comb you hold in your hands the same as before, and if the queen is not found put this also in the hive with the first or on the ground.

Now proceed with each frame as you did with the last one, bearing in mind that there is no need of looking at the side of the frame next to you after it is taken from the hive; for should you miss seeing the queen when looking down on the comb as it stands in the hive, she would, if there, get around on the inner side before you got to taking it out.

After two of the combs are out of the hive I usually set the next on the side of the hive the colony occupies, which is next to me, for with two frames out the sun can shine down between the combs as if more were out. In this way it is a rare thing that I miss a queen in going over a hive, but if I do I never try longer at that time, but close the hive and try again when the sun is right for another day.

To show what can be done if the above course is pursued, I will say that in six hours, during the middle of the day, I have found and clipped the wings of forty black and hybrid queens for a jury who had concluded that he wished his queens' wings clipped; and I have reason to

conclude that anyone can do as well after a little practice along this line.

To keep the sun just right wheel the hive around a little, one way or the other, for the time-being, where you have to work five or six hours at a time.—*American Bee Journal*, Aug., 1888.

Borodino, N. Y.

NOTE ON HONEY.

THE following notes on honey are taken from the report of the Dairy Commissioner of New Jersey, and the analyses referred to were made by Shippen Wallace, Ph. D., one of the chemists to that commission:—

To the State Dairy Commissioner:

SIR—I have the honor to submit, in addition to the regular reports of analyses, the following notes on honey, and the methods of testing that article; also a few notes on vinegar.

SHIPPEN WALLACE,

Analytical Chemist.

HONEY.

Honey consists of the saccharine substance collected by the bee (*Apis mellifica*) from the nectaries of flowers, and deposited by them in the cells of comb. While this is the commercial article, yet the production of honey is by no means limited to the bee, for there is a honey ant in Mexico which stores a nearly pure syrup of uncrystallizable sugar. A. Vieliers has reported also a honey from Ethiopia, which is the product of an insect resembling a large mosquito, which, like our wasp, makes its nest in cavities in the ground. The natives call the honey "tasma," and ascribe to it medicinal virtues, especially using it as a cure for sore throat.

The composition of honey is complex, but the essential constituent is a mixture of dextrose and levulose; and a solution possesses the physical property of turning the plane of polarized light to the left. This property furnishes an easy and accurate method for the detection of the adulterated article, and, while I have never met with a known pure honey which was not levorotatory yet there are statements on record which claim that honey has been met with which was dextrorotatory.

Honey is adulterated as much, if not more than most articles of food, and, while the adulterant is harmless, yet the fraud to the purchaser remains. The substances generally used are glucose and cane sugar. The former, on account of its low price, has been the most common, and mixed with enough of the genuine article to give it a flavor, is sold extensively as "pure extracted honey." One will also find a small piece of genuine comb honey in a jar which is filled with glucose syrup. The honey in the comb gradually diffuses itself through the mass giving the required flavor.

I have examined forty-three samples of honey the purity of which was unknown, and have also

examined two samples of known purity. The method of analysis was as follows: A Soleil-Scheible polariscope was used, the normal weight for which is 26,048 grams; that is to say, 26,048 gram of cane sugar (sucrose) dissolved with 100 c. c. water, and a tube 200 m. m. in length filled with the solution, will indicate 100 on the scale. Cane sugar and glucose will therefore indicate "plus" and "levulose" or honey will mark "minus" the zero. The same weight of glucose will turn the plane so far to the right (or plus) that it will exceed 100. The commercial glucose, when the normal weight is used, will indicate from 155 to 170, according to the greater or lesser amount of dextrine present. Pure honey will indicate from -4 to -15. Seldom, however, as low as -15, but I have found this figure in old honey of undoubted purity. It will therefore readily be seen that owing to the high dextrorotatory power of glucose, that a comparatively small amount will neutralize the levorotatory power of the honey, if added. The same, of course, is true, if cane-sugar syrup is added, but in this case the indication will not exceed 100, as will be the case if a sufficient amount of glucose is present.

The mode of procedure is as follows:—26,048 grams of the honey are taken, dissolved in a flask of 100 c. c. and the solution filtered through a small quantity of bone black in order to clarify the solution. A tube of 200 m. m. is then filled with the solution and placed in the instrument and the instrument adjusted, the indication of the scale being noted. If "minus," we may assume that the sample is genuine, for while it is perfectly possible to produce a honey which is adulterated, which will indicate "minus," yet at present, after conversation with and inquiry from those engaged in the business of manufacturing honey, I am of the opinion that the adulteration consists in the use of dextro-rotatory substances. If the indication of the scale is "plus," however, that will indicate that either cane sugar or glucose has been used, and if the scale indicates more than 100 the presence of glucose is conclusive, but if not we must proceed to learn which. This is accomplished as follows: A solution is prepared as stated, or 50 c. c. of the original solution is taken and treated with one-tenth volume of hydro-chloric acid, heated at a temperature of 80 de. C. for a few minutes, cooled and re-polarized. If now the scale still reads to the right the presence of glucose is assured, while if to the left, cane sugar is shown to have been the cause of the original reading being to the right.

The action of the acid is to "invert" the cane sugar, that is to change it to a substance which no longer is dextro, but is levo-rotatory, and which is termed *invert* sugar, and acts in the same manner as honey. While cane sugar can be added to a honey, which will not indicate "plus" yet practically the amount used is so great that such is not likely to be the case. If such should be, however, by what is known to chemists as "double polarization" would yield the amount, this being the method for determining the small amount naturally present, and if more than 5

per cent. was obtained it would indicate a probable addition.

Temperature has more or less effect on the rotatory power of invert sugar, consequently all the readings of the solution should be at a uniform temperature in order for a proper comparison.

As an adulterant, however, invert cane sugar, if made without the use of acids and not added in too great an excess, would prove a substance rather difficult to positively detect. If used to a large amount its great laevo-rotatory power—a pure invert sugar solution marking at 23 deg. C. 32.5 would indicate its presence. It has been tried, but, I understand, has not given satisfaction, and when used has been used with glucose, no honey whatever being used. It has been suggested by some that an examination of the ash of honey would indicate as to its purity. This is a mistake. I have found the ash alkaline even when glucose has been present, and I have found phosphoric acid to be present in a sample claiming to be "virgin honey," and containing no honey whatever. The amount of ash is so variable in known pure honey that this is no value.—*American Bee Journal*.

FOUL-BROOD AND DISEASE IN BEES PREVENTION ACT OF NEW ZEALAND.

From the "Australasian Bee Journal," N.Z.

1. The Short Title of this Act is "The Foul Brood and Disease in Bees Prevention Act, 1888."

2. In the construction of this Act, if not inconsistent with the context:—

"Bee-keeper" means any person who keeps or allows to be kept on his property one or more colonies of honey-bees.

"Bee-expert" means any person skilled in apiculture appointed by law to carry out the provisions of this Act with regard to the examination of bees, beehives, or combs alleged to be diseased, and the ordering of measures to be taken with respect to diseased bees, hives, and combs, by the owner or other duly-authorised person.

"Hive" shall mean any box, basket, skep, barrel, or any other receptacle in which bees are domiciled.

"Colony of Bees" means the number of bees confined in any hive.

3. For the purposes of this Act there shall be appointed by the Governor one or more bee-experts to carry out the duties hereinafter set forth.

4. After the passing of this Act it shall not be lawful for any beekeeper knowingly to keep or allow to be kept upon his premises any colonies of bees infected with "foul-brood" or other contagious bee disease, without taking the proper means described in the first Schedule to cure such disease; and if, for more than seven days after becoming aware that any bees on his premises are affected with contagious disease,

he shall neglect to destroy by fire or to take the proper measure to cure such disease, he shall be liable to a fine not exceeding forty shillings.

5. If in any locality where colonies of bees are kept within six miles of other domesticated bees there is reason to suspect that any such bees in such colonies are diseased, it shall be lawful for any two beekeepers to send in writing a notice to the owner of such colonies, and require him to satisfy them by any reasonable means that his bees are free from disease, or otherwise that he has taken measures to eradicate the disease by destroying the infected hives, bees, and combs, or otherwise by treating them by one of the modes described in the First Schedule. A copy of such notice shall be forwarded at the same time by the complainants, accompanied by their names and addresses to the nearest Magistrate.

6. On receipt of such notice the owner of such bees of which complaint has been made, shall forthwith take steps to satisfy the complainants by whom the notice was sent, either by allowing them to inspect the suspected bees, combs, and hives, or by other reasonable means, that the said bees, combs, and hives are free from disease, or that he has taken the proper measures to eradicate the disease if the same exists.

7. If after the expiration of three days from receipt of the notice the keeper of the suspected colonies neglect to reply to the notice, or if, having replied, he failed to satisfy the senders of the notice as set forth in the preceding clause, it shall be lawful for them to complain in writing to the nearest Magistrate, reporting such neglect, a copy of such complaint being at the same time sent to the offending beekeeper; and on receipt of such complaint the said Magistrate shall, without delay, instruct a constable to accompany the complainants, and with them to enter upon the premises of the offending beekeeper, and then and there to require him to open such hives and expose such combs as the said complainants may direct; and, in case of his refusal, to authorise the said complainants themselves to open and examine such hives and combs as they may deem necessary.

8. If after such inspection the said complainants shall be satisfied of or suspect the existence of disease in all or any of the hives so inspected, the constable shall require the said beekeeper, or in case of his refusal, the said complainants, to cut out from each suspected hive a portion of comb not exceeding six inches square, and to place each portion or portions of comb in separate tin cases or boxes, marking the same with a legible mark corresponding to a mark placed upon the respective hives from which the portions of combs were taken, and then and there to seal such case or box, and to deliver the same thus packed and sealed to the constable for transmission to the nearest expert, together with a document signed and in the form set forth in the Second Schedule; also, the cost of carriage, and the payment of the expert's fee as hereinafter provided for. Provided always that if the keeper of the infected bees shall, in the

opinion of the complainants, take sufficient steps to destroy by fire the suspected hives, combs, and bees, then it shall be unnecessary to send the suspected combs to the bee-expert, as above described.

9. On receipt of a parcel of comb for examination, the bee-expert shall examine the same without delay, and if, in his opinion, the comb is infected with contagious disease, or if it be free from disease, he shall notify the fact in writing forthwith to the complaining beekeepers, as also to the constable; and shall transmit with such notification directions as to the steps to be taken with respect to the colony or colonies of bees from which the combs were taken; and upon the receipt of such notification from the bee-expert, the constable shall notify the keeper of the infected or suspected bees of the result of the examination, and require him, after three days, to carry out the instructions of the bee-expert to the satisfaction of the complaining beekeepers; and, in case he shall fail to carry out such instructions within the time specified to the satisfaction of the complainants, they shall report such default to the nearest Magistrate, who shall direct a constable to accompany the said complainants to the premises of the keeper of the infected colonies of bees, and shall authorise such constable to carry out the instructions of the bee-expert, and in such latter case the offending beekeeper shall defray all the costs of the examination by the bee-expert, and for the loss of time and other reasonable expenses incurred by the complaining beekeepers or such constable.

10. If the offending beekeeper shall willfully obstruct the carrying out of the instructions of the bee-expert, he shall be liable to a fine not exceeding twenty shillings for each infected hive.

11. The fee payable to the bee-expert for examination of one sample of comb shall be five shillings, and for other samples sent from the same apiary, at the same time, one shilling for each additional sample.

12. In the case of any examination of suspected comb by the bee-expert, his fee, and all costs attending such examination and incidental to the complaint, shall be payable by the complaining beekeepers if the comb or combs be reported upon as free from contagious disease; but if found to be infected by disease, then such fee and costs shall be payable by the keeper of the diseased bees.

13. After samples of comb have been taken from any suspected hive or hives for the purpose of examination by the bee-expert, if such hive or hives shall be removed or interfered with in any manner whatsoever by any person, or if any person shall obliterate or otherwise render illegible any official mark placed upon such hive or hives, save and except upon the authority of the bee-expert, the keeper of such hive or hives shall be liable to a fine not exceeding sixty shillings for each hive or mark so interfered with.

14. All fines and penalties made payable under this Act shall be recoverable summarily under "The Justices of the Peace Act, 1882."

SCHEDULES.

FIRST SCHEDULE.

In bad cases, total destruction of bees, hives, and combs by fire.

In mild cases, as a preventative, any of the following remedies:—

No. 1. Salicylic-acid, solution for mixing with syrup for feeding bees, painting the interior of hives, and spraying combs and frames—Salicylic-acid, 1oz.; soda borax, 1oz.; water, 4 pints.

Medicated syrup for feeding bees affected with contagious disease:—(a) For use from August to May: Ordinary table sugar or honey, 10lb.; water, 7 pints; vinegar, 1oz.; salicylic-acid solution No. 1, 1oz.; salt, 10oz. Mix and boil for a few minutes. (b) For use from May to August: Ordinary table sugar or honey, 10lb.; water, 5 pints; vinegar, 1oz.; salicylic-acid solution No. 1, 1oz.; salt, $\frac{3}{4}$ oz. Mix and boil for a few minutes.

No. 2. Absolute Phenol: Pure phenol in crystals, 12oz.; water, 3oz. Shake well until dissolved.

No. 3. Phenol Solution: Pure phenol solution No. 2, 1oz.; water, 1 pint. Shake well until the oily appearance has entirely disappeared.

Phenolated Syrup:—For use from August to May; Sugar syrup is given in recipe for medicated syrup (a) (omitting salicylic-acid solution No. 1), 1 pint; phenol solution No. 3, 1oz. For use from May to August: Sugar syrup as given in recipe (b) (omitting the salicylic-acid solution No. 1), 1 pint; phenol solution No. 3, 1 oz.

No. 4. Phenol solution for spraying bees and combs: Absolute phenol solution No. 2, $\frac{1}{2}$ oz.; water, 5 quarts.

General Treatment of Diseased Bees:—Remove the diseased bees with their hive from its position and put another hive, that has previously been disinfected by painting the interior with No. 1 solution of salicylic-acid or No. 3 solution of phenol, in its place. Transfer the frames, combs, and bees from the old hive, spray them with No. 1 solution or with No. 4 solution, and put them in the new hive. Remove most or all of their honey, and feed the bees on medicated or phenolated syrup until cured of disease. The old hive must be thoroughly disinfected in the manner described, as also the hands, and everything that has been in contact with the diseased bees or their hive.

SECOND SCHEDULE.

To the Bee expert [Here insert name and address.]

I, CONSTABLE [Here insert name and address,] have this day sent you [Here insert number] portion or portions of combs marked [Here insert marks on combs], cut from hives believed to contain or have contained diseased bees, and I desire you to examine such combs and report to me and to [Here insert names and addresses of complaining beekeepers] in writing your decision and the steps to be taken with such bees, combs, and hives from which such portions of comb were taken. Fee for examination and report enclosed.

I have, &c.,

A.B., Constable.

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THE

AUSTRALIAN

BEE KEEPER'S
JOURNAL

EDITED BY
R. L. J. ELLERY AND
J. H. KITCHEN.



Melbourne:

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THE

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FEBRUARY, 1889.

[PRICE 6D.

Editorial.

THE PAST SEASON—FOREIGN NEWS, &c.

European and American bee journals arriving now are full up with articles and correspondence on wintering bees, and, indeed, this is a most important and vital question with beekeepers in England and the North of Europe, as well as in the United States and Canada in America. To get their bees safely through the long and severe winters which ordinarily prevail there, demands all the care, ingenuity, and watchfulness possible from beekeepers. In no part of Australia, however, is our winter ever severe enough to keep the bees at home a single day from cold or snow, except on the high mountains, or in country elevated over 3000ft. on its southern coast line. We sometimes read of the moisture which condenses in hives in winter being found frozen solid in Germany, and as the first layer freezes, new moisture condenses on the ice surface till it grows like a solid wall of ice on the inner walls of the hives. Australian beekeepers have no such trouble to contend with, nor do they require to pack their bees away in cellars or underground, or put their bees in hives with double walls, packed between with chaff, tan, sawdust, or some other non-conducting material as our brother apiarists have to do in the colder climates referred to. Still Australian beekeeping is not without its own special drawbacks, which are, however, very small when compared with difficulties presented by long hard winters, where everything is for weeks and even months bound up in snow and frost. Our sudden hot and dry spells are often very trying vicissitudes, not so much because of any direct injury to the bees as of the effect it has on the production of nectar in our flowers. If with a high temperature we have a few weeks without rain, nectar secretion is almost entirely suspended, and although flowers may be abundant, there is no honey flow. A mild spring, with promise of early summer is often rudely interrupted by a cold wet and stormy streak just as breeding is reaching full vigour, and the early

honey flow is taxing the whole of the hives. Such occurrences are most injurious, and not unfrequently ruin the chances of many weak stocks just as they begin to get strong. Nevertheless, the very worst difficulties brought about by the peculiarities of Australian climates are as nothing with those already referred to. In England, beekeepers have had a very bad season. Not only was the winter severe, but after a fair spring promise, wet and cold set in and continued till late in the summer, when all chances of a honey harvest was over. In America, a very fair bee season has followed the disastrous one of 1887, where severe droughts prevailed over a large part of the States, which was so bad in some places that large trees shed their flower buds before they had opened. A similar state of affairs came to pass here, for prior to the late rains the flower buds from gum trees in many localities dropped from the trees through the great dryness of the air and soil, which will no doubt seriously diminish the autumn harvest in these places.

The plentiful rainfall at the end of December and beginning of the present month, which has refreshed nearly the whole surface of Australia, certainly improves the outlook for our apiculturists, and with the weather we may naturally expect at this season, should result in a good harvest, where summer and autumn flowering trees and shrubs are plentiful. We still hear of foul brood appearing in apiaries in different parts of the colonies, but it seems to be easily got rid of wherever the clean hive and comb-building method is adopted. There is an animated discussion in the British bee journals of late concerning the qualities of various races of bees. Blacks, Ligurians, Carniolan, Cyprians and South Africans, the great popular leaning among amateur apiarists towards the *Carniolans* on account of their gentleness, has brought this variety into considerable repute, and Mr. Benton, who had hitherto been engaged in rearing pure Cyprians, either in the Island of Cyprus itself or in Austria, and supplying beekeepers all over the world with Cyprian queens, as well as advocating their

superiority and extolling their virtues, and making little of their vices, appears now to have given up that race and "gone in" for the now fashionable Carniolan and the well proved Ital an queens, and dates his recent advertisements from Laiback Carniola, Austria. I am not aware of any Carniolans having been tried in Australia. It is claimed for this race that they are extremely gentle, build comb as white as black bees (for it is well known that comb of the yellow races, Cyprians, Egyptians and Italians is always a deep yellow colour, and never looks so delicate and clean as that built by black bees), are good workers, defend their hives well, but are a little too fond of swarming. Good workers that are gentle are the bees we want, and it is certainly worth while to try them in Australia, although it is hard to conceive that any varieties can beat the best strains of Italian, now common in the colonies, more especially the darker or brown Ligurian and its first crosses. This seems the bee of the future of Australia. The brighter yellow varieties, so far as our experience goes, appear to approach nearer the Cyprian in character—excellent workers, hardy, energetic, but nervous, easily excited, and very prone to swarming.

The best Italians we know are those bred by Mr. Bonney, of Adelaide, at the Parramatta apiary near Sydney, and by Mr. Fiebig of Kangaroo Island, all of which we have proved thoroughly, and although we admire the beautiful bright yellow strain, we prefer those well marked but of a more dingy or browner hue. We hear Mr. Fiebig has not done so well in his queen rearing venture at Kangaroo Island as he deserved to do, but sincerely wish him more success this season than the last. We hope to hear that some of our enterprising queen breeders have imported some Carniolans, so that their fitness for our climate may be fairly tested.

It is quite possible our colleague, Mr Hopkins, of the Matamata apiary, in Auckland, New Zealand, may have already imported some of this variety, for he keeps New Zealand well to the fore in apicultural enterprise, and has, by persistent efforts, given a great impetus to the beekeeping industry in that colony, by re-starting the Beekeepers' Journal and re-establishing a Beekeepers' Association.

HINTS FOR THE MONTH OF FEBRUARY.

February is often a critical month for beekeepers in Australia, for in most localities the spring and summer honey harvest are over, and the autumn one not commenced. It is necessary, therefore, to examine stocks and, if short of stores, to feed freely so as not to let them fall off, and thus fail to make most of the autumn harvest. See that the queens are all right: re-queen stocks that have lost their queen and whose queen is getting too old. Look carefully for any appearance of foul brood, for it is almost sure to plainly shew itself this month if it has got into the apiary. Take immediate steps to stamp it out either by total destruction of bees, combs, hives and all, or by the method of giving them a new hive and

frames with starters only, and feeding freely, so as to keep the bees busy comb building before the queen lays any more eggs.

Sections that are full and not already removed should now be taken out of the supers and the partly filled ones moved to fill the vacancies, filling up the outside spaces with new sections with starters in. Those who are extracting should now be careful not to go too far or they will stop breeding. Supers with frames should be removed and honey extracted, for if allowed to remain it gets too thick to throw out of the combs. Take care your bees can always get plenty of water near the hives. Swarms are not unfrequent in January and February, but none but strong first swarms should be established so late in the season, and no second swarms should be permitted. If they do come off arrange to unite with other swarms or weak stocks as soon as possible, so that there is time to strengthen before the autumn is over. Great care is now necessary lest robbing commences, if honey is scarce. Opening a hive, or spilling a little feed, dropping honey or comb about or putting a feeder outside a hive is very likely to start robbing, and once started it is very difficult to stop until some stocks are ruined. Too much care can scarcely be taken to avoid any cause of robbing; and all work in which honey is likely to be dropped in ever so small a quantity should be done indoors, well away from the apiary.

Many of our readers have enquired as to the best method of taking supers of sections or frames off the body of the hive, most of them having experienced great difficulty owing to connecting combs between tops of frames and bottoms of sections. The best mode of removing a super will depend on its form, and whether there is a honey board and whether it is a super with frames or with a crate of sections. We find this a good way of proceeding. After driving the bees down by smoke or, better, putting a carbolized cloth over the sections, we insert a broad flat chisel between super and body at back of hive, and gently prize them apart sufficiently to see if the brood frames are lifting with the super arrangements; if they are, put a little wedge to keep the super raised, and then with the chisel prize the frames one by one down from their attachment to the super, when it can generally be lifted clearly off. A clean bottom board should be ready to place the super on at once, so that no honey is dropped about, and the hive itself quickly covered, in case of robbing commencing. The carbolized cloth is a capital aid in this work, as it keeps down the bees and keeps off robbers; at the same time it does not give any taste to the honey-comb while smoke does.

Victorian Beekeepers' Association

An ordinary meeting of the Association was held on Monday evening, November . Ten members present. Mr. Ellery (president) in the chair. Mr. Ellery reported that the space at the Exhibition set apart for "Bees at work" in

Exhibition had not been occupied by members of the Association as was intended, and that he had received a letter from the Secretary enquiring if the space would be used for the purpose for which it was applied for. One or two members expressed their intention of placing observatory hives in the place referred to. The Secretary, Mr. Chambers, stated he had been asked by the Secretary of Agriculture whether the Association could not undertake the erection of a bee tent, and give weekly demonstrations of manipulation of bees in hives. The members present were favourable to the proposition, and Mr. Chambers was requested to see Mr. Martin, the Secretary for Agriculture, with the view of giving effect to the proposition. Reports were given by members of the apary work during October and November, and the prospects of the honey harvest in various localities. These were generally very favourable and promising, although the long-continued dry weather was having a serious effect upon the honey flow in many districts.

Reports from Australian Apiaries

NOTICE.

Our readers and all beekeepers are requested to send to the Editors of the *Australian Beekeepers' Journal*, 28 Flinders Lane West, Melbourne, reports of their apiaries, describing their locality, the source from which bees are obtaining honey, the character of the season and amount of yield; also the effect (if any) of the dry season on the apiary, the presence of disease (if any). Any particulars whatever on apicultural matters will be acceptable, and will be inserted in the following number of the Journal.

THE GRAMPIAN APIARY.

This is a new apiary in the Grampian Hills, established by the Victorian Bee Company under the direction of Mr. H. Naveau, late of Hamilton. The company has been formed by shareholders residing in Hamilton and the vicinity, and has taken over all the bees and stock of Mr. Naveau, who in September last transported the complete apiary to a site in the Grampian Hills previously selected by Mr. Naveau. It is situated about two miles from the Dunkeld Railway Station, and half-way between Mt. Sturgeon and Mt. Abrupt. Mr. Naveau reports excellent progress, although he has had many and heavy difficulties to contend with. Moving a large apiary is no easy task, and unless done with great skill and care is often a disastrous one; but he appears to have been very successful. He states he finds a formidable enemy in a large black ant, which attacks the hives, and has great difficulty in destroying them, or keeping the hives free of them. Already he has had a good deal of heavy extracting, and the quality of the honey is excellent. His own words are: "The honey is delicious. I never had any like it during the 35 years I have kept bees. It is collected chiefly from the native

holly and other mountain flowers." "Further," he says, "the native holly is the best honey-producing flowering shrub I ever came across. I saw it here in flower during the month of May, and it is flowering still (December), and will probably flower another month. Should I remain here I shall cultivate it largely. I am saving the seed of it, and have transplanted a few plants from the mountain into our ground. It well deserves a place in every beekeeper's, and thrives in the poorest sandy soil."

Original Contributions.

ABOUT QUEENS.

(Continued from Page 37.)

FINDING QUEENS.—Finding a queen in a swarm, in a driven stock or on the frames of a hive, is one of the first lessons a beekeeper should learn. First, he must make himself acquainted with the appearance of the queen among her subjects; her shape, size, &c., as compared with other bees; and this can best be done with a frame hive, or better with an observatory hive, where all the movements and appearance can be leisurely watched through the glass sides of the hive, while the queen and the bees are quite undisturbed; for taking a frame out of a hive, no matter how gently or carefully it is done, always disturbs the bees to some degree. Black queens are far more difficult to find among her subjects than Italians, Cyprians, or Hybrids, as their colour is exactly that of the bees, the difference being only in her shape. Italians and Cyprians and their Hybrids are far more easily distinguished, on account of the orange or brown colour of their bodies, especially on the sides and under part of the abdomen.

To find a queen in a frame hive, open the hive and take out a frame, holding it up by the projections to a level with your face, and turn yourself and frame until the light falls well on to the side of the frame facing you; keep the frame hanging perpendicular, or if it is warm weather and the frame is not wired, it will probably sag and even break out of the frame. Now look carefully over the comb, especially at the sides and in any corners or holes in the comb. She is generally found on a comb with eggs and brood. Having examined one side, turn the frame and examine the other. If the queen cannot be seen, place this frame in an empty box or by the side (outside) of its own hive. Now lift out another frame, and proceed in the same way, remembering she will most likely be found on a frame with brood in, and is apt to run to the dark corners or the dark side of the frame when it is exposed to the light. Place the second frame in the hive, but away from the frames next to be examined (lest the queen crawl on to the frame just examined), and so proceed till the queen is found. Some queens, when alarmed, are very apt to leave the combs and get on to the side of the hive. In such cases it is often necessary to put all the frames as they are examined into an

empty hive body; and when all the frames are out of the hive, the queen, if not found on the combs, will generally be found among a lot of bees on the floor-board or sides of the hive.

The necessity for finding the queen is most frequently for assuring ourselves of her presence in the hive, or for examining her appearance; and although we may be generally satisfied a queen is present if we find young unsealed brood and eggs, it is more satisfactory, and is good practice, to actually sight her. Sometimes our search is for the purpose of catching her for some reason or another. The methods of doing this will be described further on. If beginners fail to find a black or dark queen, they will succeed by the following plan. Spread a large white sheet in front of the hive; bring up one side to the entrance, and pass it between the bottom board and the hive, propping up the latter a little with wedges, seeing there is free and clear entrance over the sheet as it passes under the hive. Secure the opposite side of the sheet, by placing stones or bricks upon it. If the bees are on frames, shake them off on to the sheet, frame after frame. The bees will soon find the entrance, and commence the cheerful humming which will cause the bees to crawl up the sheet towards the entrance; and by watching them as they stream in, the queen can easily be distinguished, and caught, if necessary. If it is a swarm or a driven stock, they can be thrown down altogether on the sheet, not too close to the hive, and the queen found as they run in. Finding queens in swarms is often necessary, but it requires experience, a quick sight, and some patience, especially if it be a first swarm. If a second, or cast with one or more virgin queens, they will generally be seen, by a little careful watching, running in and out of the cluster, but are not so easily caught except by a smart expert.

CATCHING QUEENS.—Most beekeepers advise you to take her gently between the finger and thumb, holding her by the thorax or shoulders, which part of her body is pretty strong, and will bear a gentle pressure without injuring her; a squeeze of the soft abdomen is almost sure to do her permanent injury; and even though one is expert at grasping a queen properly, it is certainly best not to *handle* her at all, and modern writers quite agree on this point. We always prefer catching her in a cage, by placing it over her on the comb, and then carefully slipping a card between comb and cage, watching all the time she does not get squeezed or caught by either the cage or card; for, finding herself trapped, she will make great efforts to squeeze out wherever she sees a chance. For the last year or so we have always adopted the plan recommended by Cheshire, and find it so excellent that we want no better. It requires a special contrivance, which, however, is simple, cheap, and easily obtained, namely, a piece of glass tube about $\frac{3}{4}$ inch diameter and two or three inches long, closed at one end, the open end having nice smooth edges. A large sized test tube answers very well, but is rather thin for use in an apiary. An ordinary two-ounce chemist's phial with the neck end cut off and the edges ground smooth does very well

indeed. A cork to fit the end is required to keep the queen in when secured, and good deep notches should be cut in it, so that plenty of air is admitted, without being large enough to permit the queen to escape. When the queen is found on a comb or elsewhere, it is easy to place the open end carefully over her, the glass allowing her to be clearly seen, so that with care there is no fear of injuring her. As soon as she finds herself trapped, she generally passes up towards the closed end of the tube, if it be nearly horizontal; and by tipping up the tube with a shake, she falls to the closed end; and not being able to crawl up the glass sides of the tube when it is held perpendicularly, the notched cork is slipped into the tube, and she is safe. If it is desired to put some bees in with her, which will be necessary if she is to be sent away, or kept out of the hive for any time, select half a dozen to a dozen young ones from her own hive, and put them in the tube with her, which can easily be done if the tube be kept vertical. Of course a queen must never be kept in such a tube for more than an hour or two, for they require frequent feeding, and if kept starving long she would probably stop laying for a much longer period than if kept supplied.

Correspondence.

TIMBER FOR BEEHIVES.

We find a letter from a correspondent at Lillimur, date July last, asking questions as to the kind of timber used for hives, the trade designation of such timber, and current prices. We regret his letter was overlooked, but now give him the required information:—For sides of hives, 10 x $\frac{3}{4}$ shelving is generally used, for bottom boards the same is sometimes used, but not being wide enough it has to be jointed. Shelving or American lumber can sometimes be obtained 16 inches wide, and this does for bottom boards without jointing, simply with the strengthening cleats underneath. The timber used for roof covers is usually half-inch clear timber or clear pine. The prices vary somewhat from time to time, but at present the following is very near the mark at the Melbourne timber yards:—2½d. to 3d. per square foot for $\frac{3}{4}$ thick, and 2d. the $\frac{1}{2}$ inch for roofing.

Extracts.

BEEKEEPING IN SOUTH AUSTRALIA.

MR. BONNEY'S REPORT TO THE *Agricultural Bureau*, ADELAIDE.

Mr. A. E. Bonney reported the result of his trip through the colony in the interests of beekeeping as follows:—

I have the honour to report that during the last three weeks I have given lectures on beekeeping at Woodside, Lobethal, Gumeracha, Williamstown, Tanunda, Angaston, Roseworthy College, Riverton, Auburn, Clare, and Jamestown.

The lecture at Woodside was given in the Institute on October 2, Mr. Lauterbach, J.P., presiding over an audience of 20. Whilst at Woodside I visited three apiaries, and at one I found 19 colonies of bees, all in frame hives. The owner of this apiary (who does not wish his name to be mentioned) has made 48 Langstroth hives out of kerosene cases, as well as a honey extractor, smokers, and numerous appliances required in beekeeping. He displays much ingenuity and considerable skill in the use of tools. There was a little foul brood in three of the hives, but steps were being taken to eradicate it.

At Lobethal the lecture was given on the 3rd October, in a large room at the Alma Hotel, which was kindly placed at my disposal by Mr. H. A. Waldt. Mr. Davids, J.P., presided, and there were 16 people present. This small attendance was due to the wet weather and want of advertising the meeting. Mr. Davids only received the placards as he was on his way to the lecture.

At Gumeracha I found the beekeeping industry in a most flourishing condition, and was given a list of 16 apiarists, keeping about 220 colonies of bees, all in Langstroth hives. The lecture was in the Institute, and Mr. Randell presided over 30 people. This was a most successful meeting, and great interest was shown by all present. I visited the apiaries of Messrs. Green, Monfries, and Randell, and found their hives in good condition, with plenty of honey. There was a little foul brood, but most of the beekeepers at Gumeracha appear to see the necessity of getting rid of this disease. The next day, October 5, I drove to Mount Pleasant, but was unable to give a lecture owing to a misunderstanding about the room. It had been arranged that I should give the lecture as part of an entertainment arranged by the Blue Ribbon Society in the Institute, but at the last moment this was objected to, and no other room being available the lecture could not be given. A number of beekeepers had come in from the surrounding farms, who were much disappointed, and are anxious that the lecture may be given at some future date. I visited several apiaries near Mount Pleasant, and found nearly all the bees kept in common boxes.

The next lecture was given at Williamstown on October 8, in the District Council Hall, and was the most successful of all. There were about 150 persons present, including several ladies, and Mr. C. T. Collins, President of the Independent Beekeepers' Association, presided. Amongst the audience was the Hon. J. Warren, who, when seconding a vote of thanks to the lecturer, spoke at some length in complimentary terms of the action of the Agricultural Bureau. Mr. R. Messner, of Williamstown, is one of the most skilful and therefore most successful beekeepers I have met. He has 50 Langstroth hives of bees; they are all in fine condition, and he is busy taking honey. He prefers the Italian bee, and has three colonies of pure Italians, seven colonies of hybrids, and the remainder are black bees. Being a cabinetmaker by trade, Mr. Messner makes his own hives, and has also constructed an extracting-house and other things. Everything was in beautiful order, and the bees were better cared for than in any

other apiary I have visited. Last season was most disastrous to most beekeepers, and yet Mr. Messner secured an average of 50 lbs. of honey from each of his hives.

The lecture at Tanunda was given on October 9, at the Tanunda Hotel, in a room lent by the proprietor, Mr. Richard Sobels. Mr. Bock presided over an audience of about 50 people. Considerable interest was shown, and several beekeepers took measurements of the hive and appliances with a view to making them. I visited Mr. John Jacob's farm, about three miles from Tanunda, and inspected his bees. They were doing well, but they had foul brood in a mild form; however, he is determined to cure the disease.

At Angaston the lecture was given in the Institute on October 10, and 25 people were present, including one lady. In the absence of Mr. Salter, who was confined to his house through illness, Mr. John Jacob took the chair. Much interest was shown, and several people stated their intention of entering into beekeeping. I visited several places where bees were kept in common boxes, and found most of them in good condition. Mr. Salter had obtained all modern appliances necessary for the proper management of bees, and was superseding the boxes by Langstroth hives.

The twelfth lecture was given at the Roseworthy Agricultural College on October 11, in the presence of Professor Lowrie, Mr. Ash, the students, the men living on the farm, and one farmer (Mr. Follett). There is a hive of black bees at the College, which is attended to by one of the students, who has a liking for beekeeping. I have offered to give for the use of the College a colony of pure Italian bees, with a view to having a fair test made of the merits of the Italian and black bees in a district like Roseworthy, which is not a particularly good one for the production of honey.

The meeting at Riverton was held in the Institute on October 15. About forty-five people attended, and Dr. Allwork presided. It was a great success, and numerous questions relative to commencing beekeeping were asked. I had a most attentive audience. The next day I visited several small apiaries, and inspected a number of hives. It was satisfactory to find all healthy and no sign of foul brood. I should judge that a large yield of honey could never be expected in the town of Riverton, although it might be if bees were kept in the timbered country.

At Auburn the meeting was held in the District Council Hall, and was attended by fifty people, including five ladies. Mr. George Claridge, J.P., occupied the chair. The lecture was attentively listened to, and great interest was shown in the Italian bees which I had brought with me. This was one of the successful meetings. Much to my surprise, I found on visiting the apiaries near Auburn that it was a fairly good locality for honey, far better than Riverton.

At Clare I met with a great disappointment. Although an excellent place for beekeeping, this industry appears to have very little interest with the people, and only twenty attended the lecture. The meeting was held in the Clare Institute, and

was presided over by Mr. Kelly, the Mayor. I think the lecture will induce several beekeepers to give more attention to their bees, but feel that this was the most unsatisfactory of all the lectures I have given.

The last lecture was given at Jamestown, in the Institute, on the 19th October. There were 25 people present, and Mr. Hillary Boucout, J.P., occupied the chair. As usual a good deal of interest was taken in the lecture, and I was asked numerous questions relative to the practical management of hives. At present Jamestown is not a good locality for bees, as the gum trees, which afford the chief source of honey, are young; but there is no doubt that as these trees get older they will yield a much larger quantity of nectar. I visited two apiaries belonging respectively to Miss Trilling and Mr. William Haslam, and found that the bees were kept in frame hives, but the colonies were small.

As this completed the tour that had been planned out for me, I returned to Adelaide by train on the 20th October. Throughout the trip I met with much kindness at all the towns visited. The following gentlemen were specially attentive to me, and took some considerable trouble in securing rooms and making arrangements for the lectures, namely:—Mr. Kennedy and Dr. Esau, Woodside; Capt. Randell and Mr. J. Monfries, Gumeracha; Mr. H. A. Giles, Mount Pleasant; Mr. C. T. Collins, Williamstown; Mr. E. Salter, J.P., Angaston; Professor Lowrie, Roseworthy Agricultural College; Mr. H. Beshell, Riverton; the Rev. Yeatman, Auburn; Mr. Reynolds, Clerk of the Court, Clare; and Mr. William Haslam, Jamestown.

During the first three weeks I drove from town to town with a horse and trap provided by the Surveyor-General, and in the last week I travelled by rail and mail coach.

I have the honour to be, Sir,

Your obedient servant,

A. E. BONNEY.

From *Garden and Field*.

ON THE MANAGEMENT OF BEES.

By CHARLES DICKINS.

I would strongly impress upon the beekeeper the necessity of increasing the number of bees in spring, in order to get surplus honey in the sections, or the frames in the upper storeys used for extracting. This is to be done prior to the honey flow, or the season is lost. There is another point, however, to be watched very closely in order to secure desirable results, besides an increase of bees. The latter may be done, the surplus hives filled with bees, combs started in all of them, and the apiarist thinks he is all right for an abundant crop. But alas! in a few hours he finds his bees under the swarming impulse. Out come swarms, one after another, leaving their work incomplete with but few bees to finish up the job. Under these circumstances, many beekeepers are at their wits' end. They know not what to do. It is to this point that I wish in this article to call attention. When the first swarm

comes off, let it be put into a frame hive with whole sheets of comb foundation and set aside to work out its own salvation in drawing out the combs and rearing brood. When swarm No. 2 comes off, let the hive No. 1 be examined for queen cells, which will usually be found in all stages of maturity. These are all to be cut out. Then put swarm No. 2 into this hive, first giving both lots of bees a little smoke before uniting. They will soon become a powerful colony, capable of doing good work in filling section boxes or combs for extracting. If increase be not desired, this can be repeated again and again throughout the whole apiary. Surplus honey is thus obtained in great abundance which could not be otherwise secured. It is very easy and convenient, and the bees will generally work with the will that a new swarm manifests. All swarms in frame hives should be covered with enamelled quilts, and should be liberally fed until the combs are drawn out from the foundation. Confine the swarm by division boards to as many frames of foundation as it can cover—four to six—according to the size, and add more frames in the centre of the brood nest as required, every three or four days. A swarm will work with more energy when crowded together. A strong colony will require about ten standard Langstroth frames unless supers be given as soon as eight frames are drawn out. Feeding swarms for the first few days is most important. It is necessary that bees have a plentiful supply of water near the apiary. If it is given to them in pans, throw a few pieces of wood or corks split in half for floats, to prevent the bees being drowned. For want of this many perish in the search after water. It is advisable to mix a small teaspoonful of salt with every gallon of water. It is in fact necessary for feeding the young brood that they have a supply of salt in their food.—*Mildura Cultivator*.

THE BEE INDUSTRY.

"Beekeeping in Australia" was the subject of a lecture delivered by Mr. Angus Mackay to a large and attentive audience one evening last week. Mr. Mackay claimed for the study of bee economy that it was at once most fascinating, useful, and profitable. The bee offered great allurements for the study of insect life and economic natural history. Australia, he claimed further, has peculiar facilities for bee-keeping, and the quality of honey made was of the very first order. Honey, as an article of food, was not yet, amongst us, appreciated as it deserved; but, now that really good honey could be got, its more general use was safe to follow. After an interesting description of bee life in the hive, and how observations can be made with safety and pleasure, a lengthy series of lantern pictures was brought into use, showing the anatomy of the bee, its mode of collecting stores, and the nature of its sting, which was described as "one of the hottest things in nature for its size." Then the wonderful economy of the inhabitants of the hive was described: their division of labour and wonderful industry. Analysis of the New South Wales

honey at the Technical College proved it to be a most perfect substance—the veritable “delight,” by which honey was described by the old Hebrew chroniclers. Illustrations were given of the various kinds of hives now in use, also different sorts of frames, hiving wild bees in modern hives. The lecturer terminated his remarks with a grotesque description of robber bees, which were described as inflicted with a mania for the carnings of others, “about equal to the excitement of gambling amongst the bigger animal. man.”—*Mildura Cultivator*.

SOME POINTS ON BEE CULTURE.

An American apiarist writes to the *Country Gentleman*:—

To many it may seem strange, but quite a number of beekeepers assert that more honey can be secured by removing the queen about three weeks previous to the close of the honey harvest. The theory is that stopping the production of brood turns the energies of the bees entirely into honey gathering; besides this, no honey is used in feeding the brood. F. Cheshire says that the rearing of the bee, from the egg to maturity, costs the colony the equivalent of four cells of honey; and it is only because a bee, in a fair yield, is able to requite the colony with many times its cost, that a large population means surplus; but if this large population is brought upon the stage after the harvest is over, it becomes a consuming instead of a producing population. Removal of the queen also prevents increase, which, in our apiaries, is especially desirable. When the beekeeper has a large number of colonies, and prefers honey to increase, the prevention of swarming is quite desirable. In some localities and seasons the honey flow is early and of short duration, and if he bees turn their eurgies in the direction of warming but little surplus is secured.

When a queen is removed a frame of brood covered with bees is usually taken with her, and they are put in a small hive, where they are kept until the time arrives for their return. After her removal, if preparations for swarming have not already been commenced in the old hive, queen cells will at once be started, and the bees thus endeavour to retrieve their loss. At the end of eight or nine days the queen cells must be cut out and the bees given a frame of eggs or unsealed brood, from which they can start another batch of cells. Just before this lot of cells hatch (in eight or nine days) they must be cut out and another comb of brood given. This method of management must be continued as long as the colony is left queenless, because, if hopelessly queenless, the bees seem to lose courage—they must have a queen, or the hope of one. The small hive containing the removed bees and queen is sometimes placed upon the top of the old hive, and when they are returned, the bees that have learned to recognise the upper hive as their home will, upon finding it gone, gather in a cluster upon the top of the hive, where they will remain a short time, and then take up a line of march down over the front of the hive to the entrance, and join the parent colony again.

It will be seen that this method of removing the queen entails considerable labour, and is, we think, not advisable, unless to prevent swarming, as the production of brood can be greatly curtailed by contracting the brood nest, which is a short and simple operation, requiring very little work.

The method of removing the queen that strikes us the most favourably is that of allowing the bees to swarm, then removing and destroying the old queen, allowing the bees to return, and then, at the sixth or seventh day, cutting out all the queen cells except one. This prevents increase, deprives the colony of a laying queen for about eighteen days, besides furnishing it with a young queen.—*Mildura Cultivator*.

ITALIAN BEES.

PUTTING ON SECTIONS—SYMPTOMS OF FOUL BROOD.

Written for the American Bee Journal

By G. M. DOOLITTLE.

A subscriber to the *American Bee Journal* wishes me to give a description of the Italian bee. While this would seem almost unnecessary at this late day, yet I will try to comply with the request in a sort of a general way.

This bee belongs to one of the yellow varieties, to which also belong the Cyprian and Syrian. The Italians are very quiet and gentle, in their purity, while the other two varieties named are very cross and vindictive. Italians were imported to this country about 1860, while the other two were not brought to our shores until about 1880. So far nearly all apiarists agree in placing the Italian bee at the head of all others, both as to ease of manipulation, beauty, and honey-gathering qualities.

As comb-builders the Italians are not quite as good as the black or German bee, neither do they use as much wax in capping their surplus honey, which causes it to have a little darker, or watery, appearance. They cling very tenaciously to their combs, while the black bees often fall off or run about in a frightened way, making it a nuisance to handle them, especially if a little too much smoke is used. The tenacity of the Italians makes the handling of the hives and combs very pleasant, but when we wish to get them off the combs for extracting the honey, or for any purpose, it is quite a job.

However, the main point of superiority of the Italian bee is in its honey-gathering qualities. If there is any honey to be had, they are away to the fields after it, and will toil incessantly all day for a very little, while the black bees will not work at all unless honey can be gathered quite freely. Italian bees will labor faithfully all day long for only “pennies,” while the German bee must have the “dollars” or it will not work. To illustrate:

In the spring of 1872 the writer had fifteen colonies of black bees, and three Italian colonies. As an experiment, a 14-quart pail full of maple

sap was placed in shallow dishes after adding about two pounds of sugar, so as to make a very thin sweet. With honey, the bees were started to work near this sap, and as long as the honey lasted they came in about the proportion named above—fifteen of the dark, and three of the yellow bees. As soon as the honey was gone, they took to the sap, but in a few minutes the black bees began to stop coming, so that in an hour none but Italian bees were carrying the thin sweet. These bees worked until they carried all the sap home, and had it evaporated down to the consistency of honey, while the black bees thought it not worthy of their notice.

WHEN TO PUT ON SECTIONS.

From the various letters which I get, asking when sections should be put on the hives, it would seem that there was a lack of knowledge on the part of some about this line.

In the forepart of the season a little care is required, for if put on too early they will greatly retard brood-rearing, owing to the cool nights which are liable to occur at the time, during which the bees are obliged to economize heat as much as possible. At this season of the year it is not best to put them on until the hive is filled with bees and brood, so that they can take possession of the sections at once, and if cold nights do come, the bees will crowd down into the hive below, so as to protect the brood.

Again, there is no use of putting on sections until the bees are getting honey, for they not only tend to discourage brood-rearing, but the bees, having nothing else to do, will often cut down the foundation-starters, and plaster propolis and bee-glue over them so as to make the labor of the apiarist much more than it otherwise would be.

The proper time to put on sections is when the hive is filled with bees and brood, and the bees are getting honey enough so that little bits of comb are being built about the tops of the frames. At such times the cells of comb will be lengthened along the tops of the frames, which is so pleasing to the eyes of the experienced beekeeper, thus showing that the bees are getting honey, and are ready for the surplus department.

SYMPTOMS AND CURE OF FOUL BROOD.

Another subscriber wishes to know the symptoms and cure of foul brood. When a colony has this dreaded disease, a few of the larvæ die soon after the bees seal the cells containing them. The cappings to the cells soon have a sunken appearance, with a pin-hole in the centre of each. Upon opening the cells the larvæ is found stretched at full length in the cells, and have a brown appearance, while all healthy larvæ or pupæ are white. If touched, this dead brood is of a salvy, ropy nature, and gives off an offensive smell.

From the first few cells the disease spreads rapidly until the combs become a putrifying mass, generally during the first season, and nearly always during the second, which stench at this stage, if allowed to get so far, can be smelled a rod or two from the hive. A few of the larvæ mature into bees, the population of the hive decreases until it

becomes an easy prey to robbers, when the honey is taken off by these robber bees, only to carry the seeds of the malady to the robbers' hive, for the disease to spread through the honey, and all else coming in contact with it.

The cure is to drive out all of the bees from the affected hive, and keep them shut up in an empty box until they are nearly starved, so that they will have digested all of the diseased honey. They should then be hived and fed in a new, clean hive, when they are clear from the disease. If in the honey season, a swarm issues from a foul-broody hive, it is not necessary to put them through the starving process; simply hive them in an entirely empty hive, the same as you would a healthy swarm, and as far as my experience goes, they will always be healthy thereafter, unless they contract it again by getting diseased honey from some other hive.

Great care should be taken that no bees get at the contents of the old hive before the combs are rendered into wax, and the honey and hive scalded. Other cures have been recommended, but most of them are ineffectual, except in the hands of an expert.

Borodino, N.Y.

BEE-WARRIORS.

A VICTORIOUS ARMY PUT TO FLIGHT BY BEES.

Written for Harper's Young People.

The quiet little village of Holzmengen, in Transylvania, was in an uproar one bright summer afternoon long ago, for its Saxon inhabitants were fighting for their lives against terrible odds, as they had fought many a time before. The whole slope of the hill on the brow of which it stood was one great crowd of wild-looking men, with dark, fierce faces and white turbans, and strangely fashioned armor—those dreaded Turkish soldiers, the memory of whose fierceness is still preserved in our saying that any man of savage temper is "a regular Turk."

And all this time, while the air was rent with the din of battle, and Death was gaping to devour the village and all within it, a little girl barely ten years old, with long fair hair, and eyes as blue and bright as the sky overhead, was at work in her little garden just behind the village church, as quietly as if no enemy were within a hundred miles of her.

But this was not so strange as it looked. Little Lizzie was the daughter of the sexton who had charge of the church, which, as the largest and safest building in the place, was always used as a hospital in time of war; and the work upon which the little woman was so busy, was the preparing of bandages for the wounded, who were now being brought in thick and fast.

But in the midst of all this uproar and agony and death the sun shone as brightly as ever, and the trees of the tiny garden rustled in the evening breeze; and around the twelve neat hives that stood ranged in a row, the bees were humming

blithely, as they hovered among the flowers; and any one who had shut his ears to the frightful din below might have thought this spot the most peaceful in the world.

And now Lizzie, catching up a whole armful of bandages, hurried away into the church, where she was soon so busy among the wounded men that she hardly noticed that the noise of the battle was growing louder, seeming to roll nearer and nearer every moment.

But suddenly a fearful cry from without made her look up, and through the nearest window she saw the Germans crowding wildly into the one small gate of the churchyard wall, while behind them the dark Turkish faces and snow-white turbans were eddying like a flood among the houses. The Turks had taken the village, and were coming on to attack the church itself!

Luckily it could only be attacked on one side, for on the other the rock was so steep and slippery that no man alive could have scaled it. So the brave village bailiff though bleeding from several wounds, ranged his men along the side of the wall that faced the enemy, and encouraged them to stand firm and fight it out to the last.

On came the Turks with hoarse yells of triumph, and in a moment the whole space outside the church-yard wall was a sea of grim faces and flashing steel.

And now the swarming assailants made a third charge, which brought them right to the foot of the wall that sheltered all who were left of the defenders; and while some thundered upon the gate with axes, others planted ladders against the wall or tried to clamber up it on each other's shoulders.

Another moment and all would have been over; but just then Lizzie, struck with a bright idea (which came to her from an old story she had heard one winter evening), darted back to her little garden, seized two of the bee-hives, one in each hand, and springing upon the low wall, hurled them among the swarming assailants. Two more instantly followed, and then other two, until the whole dozen hives had been flung down upon the heads of the clambering Turks.

The bees, enraged to madness at being sent whirling through the air so unceremoniously, fell like furies upon the shaven heads and bare arms of the Turkish soldiers, and gave them such a pricking that the Saxon arrows which had been falling so thick among them, seemed a mere nothing in comparison. Every man in the front ranks was literally black with the infuriated insects, which kept stinging the more fiercely the more the bewildered Turks tried to beat them off.

There was no more thought of battle or assault; for who could wield a sword or climb a wall with his head covered with a perfect nose-bag of enraged bees, and every exposed inch of his body smarting as if pierced by a thousand red-hot needles? Away flew the enemy, and away flew the bees after them, while the yells of pain of the discomfited Turks were answered by the uproarious laughter of the triumphant Saxons, who might well laugh to see a whole Turkish army put to flight by the device of one little girl.

BEE-KEEPING.

CONSIDERED AS A PURSUIT FOR FARMERS.

Written for the Maryland Farmer.

The progress of this pursuit since our boyhood days is something wonderful, and even now it is quite evident that still greater progress is in store for the bee-keeper of the future. Men, women, and children are now in the business of skilful bee-keeping, and the honey production of the country is becoming of vast magnitude.

THE BRIGHT SIDE.

That bee-keeping has a bright side is a fact which everyone realizes. At the farmer's home it speaks of the delicious sweets gathered from the flowers, and reaped and enjoyed with the smallest degree of labor and care. All day long, while the farmer is toiling in the fields, these industrious providers are gathering the very nectar of the crops for his delight, and for the health and happiness of his household.

THE DARK SIDE.

But it has a dark side, also. Not so heavy in the farmer's home, as when the bee-keeper, who has made this the one great business of the year, meets with a failure of the honey crop, and after a season's labor, places all on the losing side of the ledger. This is indeed a dark side. But with the farmer, the only dark side is the slight additional labour, and the natural dread of stings: with the study necessary to make his venture a success.

SMOKE.

Among the protections perhaps none is actually superior to smoke—a good smoker skilfully used will often prove a great blessing, and without injuring the bees, will enable the operator to handle them to his entire satisfaction. It is very true that in time of swarming very little danger may be apprehended as a general thing from bees, unless some accident should happen; for they are then too busy about important things of their own to trouble any one else. Yet the greatest care should be taken to move in the most moderate, cool, and quiet way in their midst. We used to think that certain ones—when we have seen them taking up swarms in their naked hands, and pouring them into a prepared hive—were proof against bee-stings or were almost supernaturally protected. But we have learned that such persons were protected only by a perfect self-possession and fearlessness, which beekeepers must cultivate, and if possible acquire. Meanwhile, we do not advise any one to run the risk of arousing an angry colony and suffering when by a little forethought and care he could have all needed protection.

PLANTING FOR BEES.

The whole domain of nature, rich in flowers, is the treasury from which bees gather their sweets; but it should be the aim of bee-keepers to help out the supply by especial care. It is true that bees cannot generally reach the honey in the red clover; but in white clover and Alsike they find

a good supply, and of the best quality. Some have planted large fields of buckwheat for their bees; but it does not give as rich a supply, nor as attractive a produce in the market as the others. Mignonette is also cultivated for the bees; and every year new plants are brought to notice and extolled highly. All the blossoms of the forest and the field are placed under tribute by the bees, and no farmer can go amiss in keeping a few colonies.

LAST YEAR'S DISCOURAGEMENT.

In many parts of the country last year was a great failure among those who depended upon bees and honey for their yearly income; but this was only a temporary check to the industry which is liable to befall in the prosecution of any single department belonging to the farm. It may not again occur in many years to come, and there is no reason for neglecting the important duty of gathering so great a crop as that which every farm will yield, if bees are kept.

HELPING THE BEES.

A great success is in the various methods of helping the bees in their work. So great has been the improvement during the past few years, that much of the work which took up the precious time of the bees may be done now by machinery, and the actual work of gathering the honey be left to occupy the bees more continuously. By means of the uncapping knife and the extractor, the honey is taken from the sheets of comb, and the comb replaced for the bees to fill again, saving thus the long time necessary for building new combs.

Again, comb foundation for either brood-cells or honey surplus is made, and the work of the bees is thus directed to the best profit of the beekeeper. This wax foundation is one of the greatest and best inventions connected with bee-keeping. It enables us to have straight combs of honey, in whatever sized frames we may desire, and the market is supplied with the beautiful one-pound sections which so attract the purchaser. It gives us also most perfect control of honey or brood production.

THE PAST AND FUTURE.

After such a summer in England as the bees have passed through, it behoves every beekeeper to see that a disastrous season is not followed by an utter collapse of his army of workers—workers who, unfortunately, have not had the opportunity to store either for their masters or themselves.

Already we hear of many stocks dying of starvation, and not a few skeppists declare their intention of feeding no more, as they have already fed all the summer in the hope of a turn for the better, and now the bees must go to the wall. Of course this is only false economy with sugar at present rates. Take, for instance, a common skep, well stocked with bees, and hardly an ounce of food. Rather than let them perish, suppose we give them 15 pounds of syrup, which, at the outside, will cost not more than three shillings. With a fair prospect of wintering, the following

season such stock will be worth at least fifteen shillings, without counting its swarm, and almost certain crop of honey. Is there any question about feeding being a good investment?

The oldest bee-keepers do not remember such a honeyless season as we have just experienced, and it is more than probable that the present generation may not see another such. Apiaries of fifty to one hundred colonies have not given a surplus in total of one hundred pounds; skeps have been 'taken up' by the score, and not half-a-dozen pounds of honey have been secured. Many beekeepers have had to feed through the summer, while it has been the exception to find some favoured locality or apiary where the bees have managed to get a living all the time. Such we know of where a small surplus has been given, and some stocks have even stored themselves for winter during the warm spell of weather experienced in September.

The past summer has been remarkable in that not a single honey-glut occurred while the main crops were in bloom. We have, of course, experienced poor seasons, but with the present exception we do not ourselves remember when there was not at least one honey-glut, whatever the prevailing weather may have been.

There can be no question but that bees will be more valuable next season; neither can there be any doubt that in the future honey will command a better price than has ruled for the past year or two, more particularly as American producers have also to complain of a very short crop. It will be remembered that the Americans tried a few years back to swamp our honey market, and more recently the Canadians attempted to establish a demand for their produce. Both ventures have failed, not simply because the efforts put forth were premature, nor that there was no market to supply, but because the producers of neither country were aware of the fact that their own home-markets were not, and never will be, over-stocked with this article when offered in its purest and most attractive forms.—*British Bee Journal*.

AIDS TO SUCCESS.

Having regard to our concluding sentence in the foregoing article, we must confess that there is free scope for honey-producers in this country, notwithstanding we are writing at the close of the most disastrous season on record. We have already shown that prices will improve for another year, but the present experience will not be lost in other ways. Greater economy will be induced, the apiarist will pay more attention to breeding of his stock, and will want to find why one apiary did fairly well while a hundred others were in a starving condition. Was it because of any peculiarity in the location, in the surrounding crops, in the management, or what is more than likely, in the strain of bees employed?

We base our calculations upon the latter, and while we consider that the production of honey should be a profitable undertaking, we do not hesitate to say that success or failure depends

almost entirely upon securing the right kind of bees for the purpose—a strain that will gather and store honey even in such a season as this has been. Of course a suitable locality is another great point; and before extending his plant, the beekeeper who determines to increase his business should consider well whether he is in the right situation to warrant him in doing so. It is not simply a question of good honey flora, or of shelter for the apiary. A man may struggle on for years with his bees often too late for the first honey-flow of the district, finding out at last that there is a scarcity of pollen in his district. This item is of far more importance than is generally supposed, for unless a colony has its combs well stored with it, the spring will arrive with stocks dwindling away, while had they a good store of pollen young bees would have been hatching out by thousands.

The bees which answer better than any other pure race are without doubt Carniolans, and when crossed with natives, we get workers combining the good qualities of both races with superior working capabilities. Unlike the hybrids produced by crossing blacks with Ligurians, the introduction of Carniolan blood into an apiary renders the disposition of the resulting crosses more amiable than that of the natives.

We have repeatedly recommended the introduction of these bees, judging from our own experience that the few shillings expended upon a good queen is about the best investment a beekeeper can make.

Apart from the fact that there is a greater comfort in handling them, we do not lose sight of their excellent wintering qualities, having known them to come out in spring stronger than when covered up before winter, while, when crossed with blacks or Syrians, we secure the bees which store while others may be starving. This is no bare statement, but the result of knowledge gained from a considerable experience is here presented to the honey-producer of the future.—*British Bee Journal*.

HONEY VINEGAR.

VALUABLE HINTS ON MAKING.

In the April first number of *Gleanings*, 1887, page 267, there are two articles on making honey vinegar. I have made and sold honey vinegar for the last four or five years, but I have never used good saleable honey in its manufacture. I sell about 100 gallons per year to my neighbours, and the reputation of my vinegar is such that some of my customers have driven out to my apiary, three miles from Blandon, rather than buy vinegar at the stores.

When I read the articles mentioned, I noticed that there was quite a difference of opinion between the two authors. Since then I have been experimenting. I built what I call my vinegar factory. It is not a very large or pretentious building, but it is able to turn out 200 gallons of No. 1 vinegar in a season. The size of the building is 5 x 7 ft. high on the south side, and

6 ft. on the north, with shed roof sloping to the north. Roof and sides are all painted dark brown. There should be no shade to prevent the sun from shining on the building all day long. The sides are made of shiplap (weatherboards), which gives plenty of ventilation, and is bee-proof. There is a window 2 x 7 ft., extending across the south side 4 ft. from the bottom. The building cost about \$6.00. On the inside there is a shelf 20 inches wide, 1 foot high, on which to set three barrels so that their tops will be even with the bottom of the window, and to permit the vinegar being drawn through faucets near the bottom of the barrels. The shelf is supported on stakes driven in the ground. There is a door in the north side, wide enough to admit a barrel. The barrels are covered with a piece of cheese-cloth, and on that a cover is made of thin boards.

For convenience in describing operations we will number the barrels in the vinegar-house 1, 2, and 3. I generally have about a barrel of partly made vinegar in the fall, which I keep in the cellar during the winter. In the spring, when the weather becomes warm, I put about half of this in barrel No. 3, one-third in No. 2, and the remainder in No. 1. When I have any waste honey or washings from honey-cans, or candied honey soaked from combs, it is put in No. 1. I test the sweetened water in No. 1 with the 35-cent hydrometer. When it sinks to 11 on the scale it is about right when it is not soured, and contains about 2 lbs. of honey to the gallon. If the sweetened water is soured some, the hydrometer should sink to 8 or 9. Good vinegar tests about 3 on the scale of the hydrometer. When that in No. 3 becomes good vinegar, it is drawn off and put in the cellar, and that from No. 2 is transferred to No. 3, with enough from No. 1 to fill the barrel about half full. No. 2 is filled half full from No. 1. To obtain the best results, the barrels should be kept about half full. If the vinegar in the cellar is kept cool, and the barrels bunged tight, mother will not form on it, and it will keep almost any length of time. One pound of honey will make one gallon of vinegar, as good as most of the cider and white-wine vinegar that is sold; but to make strong No. 1 vinegar it requires 2 lbs. of honey to the gallon. Most of the honey that I use for making vinegar is the thin honey which I skim from the top of my extracted honey directly after extracting.

Friend Bingham in his article, says: "I have beautiful candied honey evaporated from such vinegar as I have made and used exclusively in my family for the past twelve years, so you can get your honey out of such vinegar in case you should want honey more than vinegar."

I have evaporated honey vinegar, but I can get nothing but a very strong acid as the result. I think it is generally understood that the honey is changed to alcohol, and then the alcohol to vinegar. Now, is it a fact that the acid can be changed back to honey? Will some of the friends who understand chemistry enlighten us on this subject?

Brandon, Iowa.

G. D. BLACK.

—*Roots Gleanings*.

STRAIGHT COMBS.

SECURING STRAIGHT COMBS WITHOUT COMB FOUNDATION.

This is one of the first difficulties that the beginner in bee-culture will meet with, if he has not some good book to refer to, and even some of these only tell how to do it by using comb foundation. I believe I have never seen an article in any book or paper which told how straight combs could be secured without the use of foundation. Although it is the best and cheapest in the long run, it is not every beginner who has the money to invest, or wishes to purchase the article, therefore, the question arises how to get along without it.

The following plan was given to me by a brother beekeeper, and I have since verified it to my satisfaction:

When hiving a swarm, if you have already a movable-frame hive containing straight combs, take out one, or better, two combs, replacing them with empty frames or division-boards. Insert these frames in the new hive which the swarm is to occupy, putting them near the centre, with an empty frame between them. The bees will cluster on these two frames of brood, and will be sure to commence work on the frame between them first, and having a straight wall on each side, will be almost certain to build it straight. If honey is plentiful, this frame will soon have a straight comb started all along its top-bar, but should they build any side-combs, remove them. Now part these frames and put two more empty frames between, leaving the frame with the newly-made comb in the centre, an empty one on each side of it, and the two finished frames containing full combs on the outside of these.

Continue in this way until all the frames have a small straight comb started along under their top-bars, after which very little attention will be necessary to insure straight combs. Until then, be ever attentive, not allowing them to work more than two or three days without examining them, and cutting off all combs that may be started where you do not want them. You can get along with one full frame of comb to start with, or even without any, but in that case you must be vigilant, and never allow the bees to start building the combs crosswise of the frames.

Some beginners seem to think that all they have to do is to put the bees into the hive, in the belief that the bees will know how to manage things. The result is, the bee keeper has a movable-frame hive in which the frames are not "movable" after being filled with combs. I know of a case of this kind just across the river from here. Bees, if allowed to have their own way in frames not having foundation starters, are, I think, just as likely to build crosswise as lengthwise of the frames.

With a little experience in this way, the beginner will soon have no trouble in securing combs as straight as can be secured with comb foundation.

I might add that I have had the best results in frames with a triangular strip of wood fastened to the underside of the top-bar, instead of the comb-guide in common use at the present day.

HOW TO KNOW WHEN BEES ARE GATHERING HONEY.

Constantia, N. Y.

Can any person know when bees are gathering plenty of honey, or when they are not?

MRS. W. O. C.

ANSWER BY G. W. DEMARRE.

To say the least, this is a pleasing question. Nothing pleases the apiarist better than to be assured that his bees are gathering in the precious nectar with the greatest rapidity. How may we know this? If our hives were not so constructed that we could satisfy our curiosity by examining the combs and seeing with our own eyes the rapidly-filled cells and the gilt edged combs fringed with virgin-white wax, a sure sign of the inflowing honey, we should be left entirely to our best judgment and untiring observation when we are called on to answer the question "are bees gathering honey rapidly to-day?"

Let me illustrate here. Last fall after the long weary drought, we had some light showers and the nights became more pleasant. This started the fall bloom and the bees began to gather some honey. One day a friend in the bee business, visited me while I was looking through my apiary, and after some compliments said: "Are the bees gathering any honey of consequence to-day?" I answered, yes. "Well," said he, "I hardly see how it can be, there are very few flowers yet." "Flowers or not," I went on to say, "don't you see how those bees strike the alighting board short of the entrance and drag their bodies as they glide into the hive? They fairly glisten with their well-filled sacs. Some of them fall short of the mark and drop on the ground. This proves that they are heavily loaded. Now stand at the ends of the rows of the hives and look steadily down between the rows and you will see the bees as they leave the hives shoot out through the circling throng of returning bees, like beans shot from an old musket." "Yes," "Well, bees never leave their hives in that way unless they are gathering honey rapidly or carrying on a system of robbery somewhere." "Well," said my friend, "that is very feasible, but let us open some hives and see what they are doing." So we opened hive after hive and found the freshly gathered nectar in abundance.

By close observation and long experience, we may learn to know at a glance when bees are short of stores, or when they are queenless, or when they are gathering honey. This sort of knowledge saves the apiarist a great deal of manual labor and many times saves his property. Let me suggest here that nearly all of us look at things in a *too general* way. We must fix our attention on the things we wish to learn and probe them to the bottom. In no other way can we reasonably hope to become *experts* in any calling or any practice. Right along this line we find pleasure in bee culture. It is a deep and fascinating study, and lifts the bee student high above the *general* thinkers in particular.—
American Bee Journal.

Christiansburg, Ky.

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[PRICE 6D.

Editorial.

HINTS FOR MARCH AND APRIL.

These two months are often busy ones with bees in Australia, as in propitious seasons good autumn honey flows are not at all uncommon, and in many localities not only the best but often the most plentiful surplus is collected. We should be on the watch, and well prepared for such a contingency. Our stocks should be kept up to good working strength by feeding if necessary, by uniting late swarms or weak stocks with stronger ones, and supplying queenless colonies, or those with old or unprolific queens, with young and vigorous ones, not only for the sake of any autumn honey that may occur, but also that every stock may enter on its winter season well supplied with young bees; for one chief reason of many stocks coming out weak and dwindled in the spring is the lack of plenty of young bees in the hive when the queen diminishes or ceases her laying for the winter months. Our experience is that Italians are prone to stop laying almost entirely after the summer honey flow is over, and many cannot be coaxed to start again till the spring, by which time a large part of the old bees have died off, leaving the hive very weak. Italian Hybrids and the Cyprian crosses breed later, and can readily be stimulated to recommence late in the season. The best plan, however, is to always have young queens, that is, queens hatched and mated in December, January, or February, to supersede old unprolific ones that slacken or cease laying after January or February. Care should be taken to have room for autumn storage by providing frames of empty comb or supers of sections filled with comb, as it is wasteful of energy to keep the bees comb-building at this season. A careful beekeeper will always have spare combs in frames or to cut up for sections, in order to secure all possible from an autumn honey harvest. In extracting care must be taken not to leave stocks too bare for winter, for although late feeding will put stocks in possession of plenty of winter food, our experience goes to show that those having a plentiful supply

of sealed honey to begin the winter will come out strongest and earliest in the spring. Any cases of fine brood must be taken in hand at once, for it is almost impossible to build up a colony afresh after March unless it should turn out a very favourable season, or unless in the favoured districts of the warmer parts of Australia where an almost continuous honey flow occurs.

THE MANUFACTURED HONEY QUESTION.

Another failure in the prosecution of honey manufacturers has taken place. An officer of the Central Board of Health purchased some bogus honey at one of the jam factories but it appears the bogus bees insisted upon putting a label on each bottle before it was taken from the factory; these labels set forth that the "honey was blended to prevent crystalization or thickening." After such a precaution it was almost impossible to get a conviction, as the clause in the Health Act would not apply unless it was sold or offered for sale under the name of honey. However, the case was brought before the magistrates at Prahran, and expert evidence was given by one or two well-known analytical chemists. If the newspaper reports be correct, these gentlemen must have known as much about honey as they do of Julius Caesar's back teeth, for one stated that pure honey consisted of 75 per cent of glucose (?) instead of 75 per cent. of grape sugar. For although glucose is a form of grape sugar, grape sugar is not glucose, and pure honey does not contain commercial glucose unless it is mixed with it by the Bogus bees or adulterators, or fed to busy bees by rogues to get them to fill in empty combs with it, and so produce that splendid article sent to us from America called *Californian Sage Honey*. Such miscarriages of justice as the late Prahran case will continue to occur whilst the prosecutions are got up by people who bring but little knowledge and less skill to the work, and whilst the analytical chemists employed as experts know so little, as appears in this case, of the con-

stitution of pure honey. It almost seems that they have never seen or analysed pure honey, but have accepted some of the clever imitations as their standards of purity. It is manifest, therefore, that beekeepers must not expect any protection of their industry by law as against fraudulent imitations and adulteration when the law is administered in this clumsy and ignorant manner.

Honey producers may, however, take some comfort; for the publicity given to these prosecutions is awakening doubts in the minds of small shopkeepers and the honey consuming public, at the same time a plentiful pure honey supply this season has brought it within reach of most people, and it is to be hoped they will soon discover the difference between the mawkish and sickening glucose mixtures and the true nectar gathered by the bees, and reject the viscid nauseous imitations covered with gaudy lying labels. We are glad to find Mr. L. Chambers, the enterprising manager of the Bee-keepers' Supply Company has succeeded in obtaining a plentiful and continuous supply of both comb and extracted honey from all our best country apiaries. Every sample which we have seen would stand high in the honey shows of England, Europe and America. Shopkeepers are gradually finding a quicker and more satisfactory sale for these samples (which are all clean, pure, and gathered from the best nectar bearing sources) than has ever before been possible with the crude bush honey, and dirty crushed combs with which the Melbourne market has been for the most part previously supplied. Beekeepers must bear in mind that the honey which will command the highest price will be that gathered from the best forage, such as clover, red gum, yellow box, sugar gums, some of the honeysuckles, the native holly, and from fruit trees, and thistles, not from Ti tree, horehound, manna, gum, Cape weed, &c. Next to the source of the nectar, the form in which the honey is offered will be the most important point. If it be comb honey it must be as well filled, clean, and fresh as possible, not broken and smeared; perfectly free from brood, pollen food, and empty or unsealed cells as possible; if extracted, it must be clear and bright, and well ripened.

ENAMEL CLOTH COVERS.

Those who have used enamel cloth to cover the frames of their hives this summer will probably have noticed how persistently the bees have built wax up about half an inch above the frames, so as to raise the enamel cloth a good bee space above them. Time after time have we removed these walls of wax, and time after time have the bees built them up again, telling us as plainly as possible that they will have the space above the frames. We believe this fact points to the desirability of always having a little space between any cover we use and the tops of the frames, for we have observed that those stocks that have done best in the brood chamber have been the most persistent in this practice. It has not been noticed at all where enamel coverings are placed over sections in supers, but it has in cases when

such covers are put over frames in a super. It would seem desirable, therefore, to so arrange our mats or frame covers that a clear bee space is left between the top bars of the frames and whatever we use as a mat or cover. In the Heddon hive this space is provided for between each compartment, and our experience of this form of hive during the past season has been much more favourable than it was last year.

We adopted the enamel cloth covers this past season in all our hives, and with good results. They are cleaner than Hessian or bagging canvas, they don't worry the bees with loose fibre, and although some stocks gnaw the edges of the enamel cloth, this can be prevented by making the cover a little larger than the inside of the hive, so as to allow the cover or edge of the super to rest on it all round.

Original Contributions.

ABOUT QUEENS.

(Continued from Page 54.)

In our last number we spoke of the best method of catching queen's, and cautioned our readers against keeping her long in the tube used for catching her, even if she be accompanied by some of her own bees, for although the cork which closes the end of the tube has been notched to admit air, there will not be sufficient circulation of it in the tube to keep the queen and attendants in good order for any length of time. If it is desired to keep the queen out of the hive for more than an hour or two she will have to be transferred to some sort of a cage made either wholly or in part of fine wire netting, and containing food. Several of such cages are described in most of our Bee Manuals, and the construction of our favourite one—*Atley's*—was fully explained in a former number. Placed in a properly constructed cage, with about a dozen of her own young bees, and plenty of food a queen can, with a little care, be kept alive and in a healthy condition for weeks, and if placed in a miniature hive with combs containing honey and a hundred or two of bees, she can be safely sent on a sea voyage lasting many weeks (if she be not exposed to extreme heat or cold), although such an ordeal does not improve her fertility.

Queens, accompanied by a few of her own bees, are often sent by post from one place to another in cages supplied with food, and in this way we get queen's from Adelaide, New Zealand or Sydney, and our bee-keepers in the country obtain Italian or other queen's from agricultural dealers in town.

A very convenient cage for sending queen's by post is known as Benton's cage, and is made from a piece of pine or willow $3\frac{1}{4}$ long, 1 inch thick and $1\frac{1}{2}$ wide; 3 holes $1\frac{1}{8}$ diameter, and bored almost through with a centre bit. Two holes, one at one end and the other the centre one, are bored so close together that no partition is left between them, while the other end one is bored so as to leave a thin partition; this hole is for the food, and an opening about $\frac{1}{2}$ inch wide must be made

in the partition to enable the bees and queen to get at it. So that in fact the cage consists of 2 living chambers and a food chamber. Saw cuts are made at the end of the cage right into the hole occupied by the bees so as to admit of circulation of air. The sides of the cage outside have 2 quarter inch grooves cut the whole length, and the saw cuts for air are made at the bottom of these grooves. The cover is about a quarter thick, the same size as the cage block, and is generally grooved on its underside like the sides of the cage itself, so that when it is nailed down over the holes with fine pins, the grooves admit a further supply of air. A piece of honey-comb is put into the food chamber, or it may be filled with *Good candy*—a very stiff paste made of powdered sugar (icing sugar) and honey, when it is ready to receive the queen and bees, which can rarely be shaken out of the glass tube into the cage, covering at the same time the second chamber with a piece of card, which should be slid carefully over the third hole as the tube is withdrawn. Now by placing the cover over the card the latter can be slowly drawn out and the cover nailed down.

Whenever it is necessary to keep a queen in a cage over night, it is the best way to place the cage under the mat of a good strong hive, as both the air and the temperature are suitable.

To judge a queen by her appearance. When queen cells are formed either under the swarming impulse or by a colony made queenless, but little difference can be seen until they are sealed over, when it can generally be observed that while some are long, tapering, and pointed, others are dumpy and round ended, or crooked or cramped into an awkward corner. As a rule, those queens hatched out from a long straight-pointed cell are the finest, although well shaped queens often emerge from badly shaped cells. A young queen not long hatched has a different look to one a few days old, for each day she becomes more developed, and after mating takes on a much more important aspect.

A good queen, of whatever breed, should be of a fair size, perfectly shaped with perfect and undeformed wings, and a long tapering abdomen, the legs should be all well shaped, and not stiff, deformed, or broken in any way, for in examining several queens some of these defects are frequently seen. A short dumpy queen, with a broad but short abdomen, seldom turns out well; neither do queens with any of the defects mentioned, although a good queen with a damaged wing will often turn out satisfactory. Small queens are not regarded with favour by experienced bee-keepers, although it frequently happens that a small one, if well and symmetrically shaped, will turn out better than larger ones.

With respect to colour and markings, this, of course, varies with the breed. The queens of black bees are usually pretty dark on the back of thorax and abdomen, but often of a lighter colour (brown or even dark orange) underneath. This is probably due to some strain of Italian blood for it is now difficult to find black bees without some trace of this. Crosses between Italians and blacks will have more or less of the orange or brown

colouring beneath and on the sides of the abdomen, and while some quite black will produce workers marked almost as regularly as the true Ligurian, it frequently happens a fine dark orange coloured specimen will produce bees almost wholly black. With pure Italian queens, the colouring varies very much from one hardly to be distinguished from a hybrid black to others whose whole abdomen is quite a bright orange brown. Some Apiarists prefer such ones with the point, or last segment, of the abdomen much darker, and approaching black. Cyprians, as a rule, are lighter colour than the Italians but cannot be readily distinguished from the latter, they are, however, generally rather smaller and more slender than the Italian, and when young are unequally coloured on the abdominal segments giving them a slightly striped appearance. The purity of the queen is best seen by her progeny, both Italians and Cyprians produce workers which, when distended with honey, show three distinct yellow or orange brown bands on the back of the abdomen, that is, the first, second and third abdominal segments are either partly or fully so coloured but often show only two when the abdomen is more or less empty. The bees of Italian or Cyprian queens that have been mated with a black drone will be made up of some well marked with the three bands, some showing only two and some quite black. *(To be continued.)*

News from Colonial Apiaries.

A SUSPENDED APIARY.

An enterprising young beekeeper, owning 100 stocks in full work in the Horsham district, called on us a few weeks since to see how our own apiary was managed. He gave flourishing accounts of his own locality, and of the success that had so far attended his venture. He informed us that at first he almost despaired of keeping bees at all, in consequence of the constant annoyance to the bees caused by myriads of a small kind of black ant. Eventually, however, he established a thriving apiary despite the ants, by means of a rather ingenious contrivance.

It is often stated that ants give no trouble to strong healthy colonies, and only attack weak or queenless ones. This is true of many kinds of ants, but there are some small species that become troublesome by reason of their smallness and immense numbers, and simply worry the bees till they are worn out or strike work. This was the case with the bees of the apiary we are speaking of.

The plan our informant adopted, and which has been completely successful, is as follows:—He keeps all his bees under rough sheds. From the roof of the shed he suspended, by means of fencing wire, a long frame of quartering, constructed so as to form a bench for the hives to stand on; this frame or bench hangs on these wires about two feet above the ground. The frame itself is about 14 inches wide, and the suspending wires spread out till they are several feet apart where they are fastened to the roof. On this frame the hives are placed about three feet

apart, quite safe from the ants, which up to the present have not found their way to the hives by going up to the roof and down the wires; and if they did it will be an easy matter to stop them travelling on the wires by painting them with a little tar and oil. To prevent the suspended apiary from swinging about with the wind, guys of wire fasten the frame to the shed posts back and front, which keep the apiary quite steady.

OUR OWN APIARY.

After a quiet time, with only a moderate income of honey, bees are busy again on several varieties of eucalyptus. A week or two ago the scarlet flowering gum, *eucalyptus ficifolia*, was in full bloom in the gardens and grounds around about us. These flowers were dripping with honey, and shaking the tree raised a cloud of bees from the blossoms from sunrise to sunset, and makes one think what a glorious country for honey-gathering must be those forests and timbered hills in Western Australia where this beautiful eucalyptus abounds. Following these the manna gums, or *eucalyptus viminalis*, have come into luxuriant flower, scenting the air with its odour, and attracting such numbers of bees as to give one the impression of a full swarm on the wing. The plentiful rains in January, and early in February, produced a second crop of wild flowers in meadows and fields, so that bees have found pollen in abundance, and breeding has gone on vigorously in most of the hives. Several swarms have come out since the first of February, and all have become well established.

Foul brood made its appearance in two stocks in December, but prompt action, that is, getting all the bees and queen into a clean new hive, filled with frames with starters only, destroying at once all the old frames, brood honey and all, feeding freely for a week or so on plain syrup, has stopped further progress, and the stocks are now strong again, full of healthy brood and honey. Our bees consist of pure Italians, Italians with some Cyprian blood, and both kinds crossed with black bees. Our best results so far have come from the Italian-Cyprian, then the Italian, and last the hybrid blacks. One exception in favour of a stock of Italian black hybrids must, however, be mentioned, which has given so far the heaviest return of all. We have made some experiments with several forms of hives, the result of which will be given in our next.

THE GRAMPIAN APIARY.

We gave in our last number Mr. Naveau's statement of the value of the native holly of the Grampians as a honey plant, remarkable not only for its plentiful supply of nectar, but also for the surpassing excellence of the honey. We have ascertained the botanical name of the shrub is *grevillea acanthifolia*. It has a leaf exactly like the common holly in shape and character, but is slightly downy on its under surface. Mr. Naveau is convinced it will pay for cultivation as a honey producing plant, as it is hardy and quick growing, and stands a dry season well.

Extracts.

BROOD-CHAMBERS.

Dr. Tinker has a long article in the *American Apiculturalist* of December last, entitled "A New Management of bees, Brood-chambers, Brood-frames," &c., in which the chief points advocated are:—(1.) Keeping the brood-chamber for brood solely; (2.) The use of honey-boards; (3.) The indulgence of the natural-swarmling instinct, without allowing increase; and (4.) The production of comb-honey, or extracted in larger quantities than by any other method. In working this system we are told that a storifying hive, used with a queen-excluding honey-board, has great advantages over all others—that the invention of the wood and zinc queen-excluding honey-board marks an era in the progress of apiculture, and goes a long way towards solving the problem of "How to obtain the largest product from our bees.

Let us take the ideas on the above-named points, and compare them with our English notions. (1.) *The brood-chamber*—Now, the small brood-chamber and the storifying system are *pre-eminently* English, and have been in use here for generations. Witness the small straw skep, with its 'super' mounted above, and the first frame-hive which came into general use in this country, viz., the Woodbury. Also, above all, we have the Stewarton, which is, *sui generis*, a storifying hive, in which the brood is confined to two small chambers, together affording about the capacity Dr. Tinker advises. We are told that there must be no room in the brood-chamber for honey that should go into the supers—that such brood-chamber (English 'body-box') should contain about 800 square inches of comb—that the one used by Dr. Tinker, containing 830 square inches, is formed of a very plain and cheaply-made brood-case, which holds eight hanging Langstroth frames, 7 inches deep by 17 inches long, outside dimensions, upon which is placed a section case containing 24 sections $4\frac{1}{4} \times 4\frac{1}{4} \times 7\frac{7}{8}$ inches.

When speaking of 'square inches of comb,' cubic inches are evidently intended, since it is added that '50 workers can be reared every 21 days in each square inch of comb. As each square inch of surface contains 25 worker cells, both surfaces of the comb must be counted in order to produce 50 cells to a square inch, or rather to two square inches of surface. The actual comb surface contained in eight Tinker-Langstroth frames is 1720 square inches, or 860 cubic inches, if we suppose the combs to be one inch thick. It so happens that eight British standard frames contain 864 cubic inches of comb, supplying a brood nest very little in excess of that used by Dr. Tinker. But few English apiarists consider 10 standard frames too many for the brood-chamber, when the storifying system is followed, and, with supers piled on, it is difficult to prevent swarming, the whole 10 frames, when the queen is young and prolific, being filled with brood, so far as it is in the nature of the bees to fill them. However contracted the brood-

chamber may be, we have rarely seen its combs more than two-thirds or one-fourth of each frame—above and around the brood—are invariably assigned to stores of unsealed honey and pollen, during the breeding season, and this arrangement we have never been able to prevent. The doctor's contention, therefore, that 40,000 workers can be raised every 21 days from the brood-chamber of 830 cubic inches of comb, is likely to prove a fallacy, even if we allow (for the sake of argument) the possibility of preventing a large and prosperous colony, treated on the swarming system, from building drone-cells.

With the chief points of his scheme we are fully in accord, but when he gets it into full working, further experience will, we think, prove the necessity of allowing a brood-chamber of the capacity of from 1000 to 1100 cubic inches of comb, or, in other words, to 10 British Standard, or 10 Tinker-Langstroth frames, each of which contains about 1080 cubic inches of comb. The comb capacity of the old ten-frame Woodbury hive was 940 cubic inches, which was found too small for a storifying hive.

(2.) *Queen-excluding honey boards.*—We are told that the invention of the honey-board marks an era in the progress of apiculture, creates possibilities heretofore unknown, and goes far towards solving the problem of "How to obtain the product from our bees." Not only the largest quantity, but also 'the finest quality of comb or extracted honey,' might have been added. The honey-board recommended consists of wood and zinc, each zinc slide, or slip, to have two rows of perforations, which are said to afford sufficient ventilation to supers—so necessary to rapid ripening of the honey, and free passage to the working bees, which are neither obstructed in their work, nor in the production of honey limited thereby in the slightest degree. The use of such a honey-board limits the brood space to the actual requirements of the brood, and it ample room is given in the supers there is no trouble with excessive swarming or carrying of pollen into the supers.

(3.) *The indulgence of the swarming instinct without producing increase of colonies.*—The improved system of management begins with swarming, all colonies having been built up to full strength before that time arrives. It is a well-known fact that colonies which divide their working forces by swarming do not collect so much surplus as those which do not swarm, therefore a system of management which prevents division, without checking the working *vim*, must give the largest returns. All colonies are brought up to full strength by the commencement of the honey flow, and receive supers. If a swarm issues from any colony, it is hived on the old stand, and the supers are transferred from the old to the new hive, the new brood-chamber receiving empty reserved combs, or frames filled, or partly filled with foundation, or both combined. The bees remaining on the combs in the old brood-chamber are shaken off and allowed to run into the new hive together with the swarm, and these combs, full of hatching and immature brood, are placed in an empty hive upon an excluding honey-board, and

set upon the brood-chamber of another colony which has not swarmed, but which is sufficiently strong to be able to take charge of this additional brood, and at the same time the supers, together with the honey-board of this latter colony, are placed over the newly added brood. The queen-cells in the transferred brood may either be cut out or allowed to remain. Placing the brood with its queen-cells upon another colony does not cause it to swarm, because the old queen below is not aware of the existence of the queen-cells above. By this plan surplus brood-combs accumulate after a time, and on them future swarms may be hived. A supply of virgin queens may also be provided with the minimum of trouble and expense if the queen-cells are allowed to remain in the comb transferred after swarming. But on the management of queen-cells, virgin queens, and drones, Dr. Tinker promises another article. He further states, 'For years I have sought a remedy for the many braced combs which bees often build between the brood-frames and honey-board and supers. It is at last found in this new system of management. In all cases of large swarms, and where brood is placed over other colonies, there are no brace combs built anywhere, so that all parts of the hive are easily separable.' The Doctor also states 'a remarkable fact, never before made public,' when he says "My improved honey-board has never yet been passed by a queen, either laying or virgin, so that virgin queens that may hatch in brood-combs above laying queens cannot pass down to destroy the laying queen as they are sure to do if they have a chance, for no queen-cells in combs placed above the honey-board are ever destroyed by the bees of other colonies to which they may be given. Thus all depends on the perfect working of the honey-board."

(4.) *Comb and extracted honey can be produced in larger quantities by this than by any other system.*—This goes without saying if all that is predicted of the system be trustworthy. Since all the bees of every colony are kept together, and yet the swarming instinct is indulged, while the laying powers of the queen are stimulated to the utmost, it follows that the working energies of the bees will be as great as possible. Hence we may fairly expect the largest possible storage of honey. Judging from our own practice and experience, we are favourably disposed towards Dr. Tinker's method. Indeed the plan, minus the honey-board, is the one we have always found most productive of the finest quality of honey whether in the form of comb or extracted. For the production of the latter we decidedly recommend the shallow-framed supers over the brood-chambers, and the invariable use of the improved queen-excluding honey-boards. We hope that some of our readers will give the plan a trial in the forthcoming season, as we ourselves intend to do.

For several days the church clock at Harpenden refused to work. On an inspection being made it was found that a swarm of bees had taken up their abode among the works.

It is said that bees do not like dark clothing, and that a person dressed in white is less likely to be attacked. It is worthy of further observation.

Chloroform.

AS A PREVENTION OF INCREASE— INTRODUCING QUEENS, &c.

Written for the Canadian Honey Producer BY W. KIRBY.

During the past season many articles have appeared in the various bee papers, written by some of the most extensive and most experienced beekeepers of the day, on the important subject, "The prevention of increase in working for comb honey." The sum and substance of all that has been written is to give plenty of room to a colony to prevent them getting the swarming fever, and the vigorous use of the extractor to deprive them of the swarming fever after they once get it.

In my opinion, prevention is better than the cure, by a long odds. This extracting of nice sealed honey out of the brood-nest (which makes the best of winter stores) is something I could not tolerate, to say nothing about the extra work for nothing, when a much easier and simpler method will do.

The swarming fever appears to be, and is, the great trouble to get over when the bees once get it. The best, the easiest, and the quickest, and the cheapest way to cure that fever is by the use of chloroform, given to them by the smoker, just at dark when the bees are nearly all in the hive—to be given to them until they lie like dead bees upon the combs, or until not a bee will fly when the honey-board is taken off and the hive kicked.

Two years ago last June I treated a colony just as I have described. They had their first queen-cell capped, and would have swarmed the next day. The morning after the drugging they went to the fields as usual, apparently none the worse for the dose. Upon examining them in the evening, 24 hours after the drugging, the queen-cell was still intact. Forty-eight hours after drugging, I examined them again, and found the cell still intact, and no further progress had been made on any of the other queen-cells.

They had one case of sections on. I then took away all finished sections, and filled up again with sections containing full sheets of foundation. Seventy-two hours after drugging, I examined them again, and found the cell torn to pieces. About a week after this I gave them another case of sections; there was a steady, moderate yield from the raspberry during this time. The colony gave me about 50 pounds of nice finished sections that season.

The above experiment convinces me that chloroform is the specific.

When a swarm issues, put it back, take away all finished sections, and fill up again, and give room enough for all the bees to work; then give them a good drugging in the evening. Before morning they will get rid of the effects of the drug, and will have forgotten, or given up all notion of swarming, and go to the fields to gather nectar and pollen as usual the next day. I find chloroform very useful in the apiary.

In introducing queens not a queen need be lost. Also in the uniting of colonies, not a bee will be lost from fighting excepting one of the queens. Also in moving bees about the apiary, set them anywhere, and in the evening give them a dose. In the morning they will be seen marking their location as they fly out, and will return to it, they having forgotten all about the old one. I suppose ether would as well as chloroform, although I have never used it.

In all cases the drugging should be to a stupor, except in introducing queens in a honey flow, when very little or none is needed. Objections may be taken to the use of anæsthetics in the apiary, on the ground of their being injurious to the bees. My observation has been very close, and so far I have not been able to detect any difference. Twelve hours after a colony has been drugged, they will be as brisk as ever. As a proof of this, take a queenless colony in the fall that is being robbed by wholesale, no defence being made at all; drug in a queen in the evening, and in the morning watch and see how the inmates will shoot up off the alighting-board at the robbers as they appear.

The foregoing remarks are from my own observation and experience. My theory for the prevention of increase in working for comb honey originated with myself (never having seen any thing written on the subject.)

I only tested it on one colony; but I have no doubt but what chloroform will prove effectual every time if properly used. I do not need to prevent increases as yet, because I am working up an apiary from a small beginning, but if the time ever comes that I shall need to, chloroform is what I shall use to accomplish my purpose.

Oshawa, Ont.

USE OF CHLOROFORM IN HANDLING BEES.

Written for the American Bee Journal by
C. E. WOODWARD.

On page 742 some one asks if any ill-effects would follow the use of chloroform in quieting bees, or introducing queens. As I have never seen any method for its use in the apiary, from our leading apiarists, I will give the method I use for uniting colonies and introducing queens.

In the first place, we must take into consideration the powerful liquid we are to use. Chloroform is a colorless, volatile liquid, and is very powerful for man or beast, and should not be allowed in the hands of any child.

Get the chloroform and three sponges, and saturate one of the sponges with the liquid; dampen a sponge with water, and put the sponge into the bee-smoker; then put in the sponge saturated with the chloroform, and then put in the third sponge. Be sure that you have the sponge saturated with the chloroform between the two sponges dampened with water. This will hold the strength of the chloroform.

Wet a cloth with water and cover over the frames of the hive that is to be manipulated, and cover the hive up again. Now take the smoker and give the bees two puffs of the chloroform. Then go to the next hive and operate on it as before. If you are uniting bees, then go back to the first hive and give them two puffs more. By this time the bees will be "silly," and the queens may be allowed to run in, and all will be right.

The bees may also be united with perfect satisfaction, and without loss. No consumption of honey is needed, no sweet solution is wanted, and the perfumes of cremated wood are uncalled for. The time is fast approaching when the old 48-hour-method will become obsolete.

South Newhury, Ohio.

Italy.

A VISIT TO THE QUEEN-BREEDER OF ITALY.

Written for the British Bee Journal BY T. B. BLOW, F.L.S.

The many controversies which have arisen during the past with respect to the merits or demerits of the Italian bees, induced me, in the interests of British beekeeping, to pay a visit to the north of Italy, to study them in their native habitats, and to come to some decision as to their qualities as compared with other races, and more especially with the English bees.

Those who have carefully noted the published accounts of the Italian bees from their first introduction will remember the surprising successes that were years ago achieved; and I could call to mind several who have kept Italians for many years, and still hold that they are far ahead of the blacks. The Americans, too, quite upheld this opinion, and hold it strongly still.

Carefully considering these facts, I was led to think that the root of the evil, and the reason of the many grievous complaints that have lately been made, might lie in the inferiority of the queens imported during the last few years. Those who years ago went in strongly for Italians (and have succeeded) usually kept in stock by breeding from the best, rather than by constantly importing queens. And the same method obtains in America, where most of the Italians are home-reared—not imported—and I think it will be admitted on all sides, that, as far as scientific queen-rearing is concerned, the Americans stand at the head of the world, though the successful persons in England, that I allude to, are individually equal.

To get the best results we ought, undoubtedly, to import the finest queens, and then to rear the best from them here, keeping up the stock with occasional importations, perhaps. In this way we can perpetuate the best features of the race, and at the same time get bees that are perfectly

acclimatised. For it is an admitted fact, that the bees, the immediate progeny of imported queens, are far more liable to disease—especially diarrhoea—than are the progeny of a home-reared Italian. And, with the facilities which modern beekeepers have, there is not the least difficulty in getting the home-reared queens purely mated, and thus practically keeping our strain pure, if absolute purity is desirable.

The complaints made by those dissatisfied with Italians are: 1. They do not winter well. 2. As honey producers they do not equal the English bee. 3. That they are very vicious and unmanageable. 4. And lastly, some have asserted that a very virulent form of foul brood has been introduced by them. From an examination (extending over a considerable time) of many apiaries, I have come to the conclusion that most of the evil repute that has fallen upon Italians has been brought about by the inferior queens sent. In some cases the breeders knew nothing about their business, and procured the cheap queens which are sent so freely in the autumn, by going around and collecting them from the colonies condemned by the country people to be taken up for the honey; they get these and the bees for about a franc each.

By this system many queens would be quite old worn out, others unfertilised, and therefore drone-breeders; and in a district where foul brood occurred, of course the disease would go with the queens, and disastrous results would follow by its introduction into the apiary of the unsuspecting British bee-keeper. I have in my mind's eye one case of a well-known cottage bee-keeper, whose apiary was utterly ruined by the introduction of foul brood by Italian queens. This system of getting queens from condemned bees. I saw in full swing in many cases (in one case by the servants of a well-known exporter); the time of year being most favorable for this practice, and I certainly saw several fine examples of foul-broody combs.

In other apiaries no trouble seemed to be taken with the quality of the queens, such as selecting the best queens to rear progeny from, nor was any attention paid to the rearing of drones from suitable colonies. These great considerations were quite neglected; the great point seeming to be, the largest number of queens in the shortest possible time, and with least trouble; and, as far as I can judge, many were sent off without it being definitely known that they were fertilized, and I feel sure that some such queens arrive in England, and are here fertilized, as, in the course of my experience as an expert, I have had shown to me many colonies of bees that I was assured were the progeny of an imported queen, but were certainly hybrids.

My visits to apiaries extended over the country between Bellinzona and Montselice; this embraced the mountainous district of the northern Italian lakes, and the plains of Lombardy, and again the hilly country around Bologna.

I may say at once that I certainly prefer the bees from the mountains, as they seem much more vigorous and hardy; and the results in the way of honey-gathering, as far as I could get at the facts,

were certainly far better. The bees from these hilly parts would, too, be better suited for our climate. The number of apiaries visited was large, yet I can count upon my fingers of one hand all those who knew anything about their business; and if those who took a real pride in the production of their queens, and who use really scientific means to insure the best results, then the number would certainly be less than five.

I shall describe the apiaries of the best of these, and their methods; but before doing so, will give the conclusions which I came to with regard to Italians: That, excepting perhaps Carniolans, there are no better bees than Italians if care is taken to get the best queens from a breeder of recognized merit.

That the bees of the mountains are hardy, vigorous workers, great honey-gatherers, prolific, and certainly gentle, and in their own country not given to robbing much.

That to get the best results from Italian bees, we must get a good strain to start with, and then, by careful selection, rear our own queens, and be constantly on the look-out for those having the most desirable characteristics, and to propagate them on their own.

I can name one very striking case in my own country, where all these points have had most careful attention given to them, and with the result that the bee-keeper is not only the best in the country, but one of the best in England, as far as results go; and practical results (the largest amount of honey, of the highest possible quality, got with the least expenditure of labour on the part of the bee-keeper), are what we require in this age of keen competition.

The first apiary which I visited belonged to Jean Pometta, and was on the hills above Gudo, near Bellinzona. He had promised to meet me at Bellinzona station; but on account of the breakdown of the telegraph wires, owing to a heavy fall of snow, he failed to be there. However, it was not much trouble to find him. Everybody whom I asked was able to direct me to the man who had a lot of bees; and after a most picturesque walk of two or three miles I arrived at his home, in the midst of vineyards, and with a waterfall close by, which would have made the fortune of any man in England who possessed it.

He was from home; not having got my telegram he did not expect me. I had a chance, therefore, of looking at his apiary at my leisure, and without any interruption, which is an advantage. His father (a venerable old man) received me in a very hospitable manner, and, as Mr. Pometta is a vineyard-owner as well as a queen-breeder, I was able to see all the vintage operation in full swing. I may say that he takes pride in his wine products as well as in his bees; and he showed me with great interest an ancient-looking, squat flagon of Aqua Vite, very old, of his own distilling, that had taken the gold medal at Zurich.

I found an immense number of colonies of bees, many of them in bar-frame hives with straw sides; the majority of them on the Italian plan, opening at the back, and iron tongs being used to remove

the combs. There were, too, a large number of nucleus hives, with bar-frames lifting out in the ordinary way. The bees were the leather-coloured strain, not the bright coloured bees such as I saw later on in Lombardy. To show their energy, I may mention that Mr. Pometta told me that they are usually at work at six in the morning, and that on one or two occasions he actually saw them work by very bright moonlight. We have heard this same story from the Americans, and I fear every one has doubted it.

On Mr. Pometta's return we looked through many colonies, and I had explained to me his whole system of queen-rearing.

The system used of rearing queens depends upon the time of the year. In the early spring (when loss of heat must be much guarded against) a colony is taken, and, by means of three dummies, is divided into four nuclei, the hive being made with four entrances for this purpose. In this way five queens are secured from one colony, and though the system is a somewhat wasteful one, yet it answers, as the price obtained for queens in early spring is comparatively high. Another plan is to preserve a large number of small colonies with young queens in the autumn. In the spring two or three of these can be united, and one strong colony formed, and the surplus queens sold.

As the season advances, the nucleus hives are used; each nucleus being large enough to be again divided into two. By this plan better queens can be reared, and in good quantity too. The bars of these are of just such a size that two will fit into the large bars of the Italian hives. This, of course, is of great service to the queen-rearer in many ways, such as making up nuclei for queen fertilization, and afterwards for strengthening such with hatching brood.

SOME NOTES ABOUT BEES; ALSO ABOUT THE FESTIVAL APIARY, REDLAND.

Within the last decade of years a revolution has taken place in bee-keeping as great in its way as has occurred in dairying. Our fathers who kept bees in the rustic-looking straw skeps, and who annually consigned half of their industrious little workers to the sulphur pit, never even dreamed that their sons would consider such treatment as the height of barbarity, and would wonder at the ignorance of their parents. Bee-keeping is now a scientific occupation, exact and practical as is that of the pedigree stock-breeder, or of the manufacturer, or of the mechanic. It was left by other nations to the practical Americans to so mechanically improve the construction of the bee-hive as to permit of any part of it being instantly investigated; thus the life history of the bee has been completely worked out, and man by still further mechanical contrivances, such as comb-foundation, &c., so aids the bee that these industrious insects waste no labour, as they previously did to an enormous extent when undirected by man. Instead of sulphuring the bees wholesale, the apiarist now considers it sacrilege to kill a single bee, and even

laments the inevitable death of the bee that stings him. He encourages by various means in his power the increase of individuals in the hive, well knowing that only by keeping his "colonies" strong in numbers can they, like nations, hold their own against enemies. The modern bee-keeper breeds his queens as does the stock-owner his "duchesses" and "dukes," and, as the queen's value is solely according to her prolificness, unless her Royal Highness proves herself equal to producing 2000 eggs per diem during the height of the season she has her head nipped off as remorselessly as was that of Mary Queen of Scots by her rival Elizabeth. It may astonish the uninitiated to learn that the life of a worker bee during the busy season is only a brief six weeks; not but that it would live longer if it took things easy, which it will not do, its anxiety for the future being too great, and like the majority of mankind it wears itself out in preparing against evils which never arise. Through incessant work, roaming over the land in search of flowers, its wings get weather-worn; then some day a storm overtakes it and beats it to the ground as it is labouring to return home with a heavy load; the ants then think it is their turn, and the poor bee never gets to its hive again; also birds easily nip up a heavily-laden bee slowly flying homeward. There is no bird so destructive to bees as the wood-swallow. I do not mean the ordinary swallow, and martin, but that family of birds called *Artamida*, or wood-swallows, a family peculiar to Australia. The common Queensland representative is the *A. cinereus*, and the reader can know that he sees this bird if he note a group of from six to twenty gray birds with black cheeks and white bellies sitting close together on the dead branch of a tree, and every now and again one of them flying off, making a dive, nipping up some unfortunate insect, and returning to its perch. I have shot forty to fifty of these wood-swallows this spring, every one of which has had its crop full of bees. The crop holds twenty bees, and then the bird cries "Enough," and rests on the branch awaiting digestion. Observation showed me that the birds will take three or four such meals a day—that is, say, sixty or eighty bees. This colony of forty or fifty located themselves on a tall tree above my apiary, and for some weeks I did not interfere with them, for I like birds about a home garden. However, at last things got too serious for the bees; indeed, the birds would simply have destroyed the apiary; so I shot them. The real bee-eater (*Merops ornatus*) also will rapidly decimate an apiary situated near where these birds are numerous. This bee-eater is a summer visitant, and is partial to sandy poor country, for it nests in a hole burrowed out of a sandhill. It can be known by its beautiful shape, elegant flight, green-blue colour, and the two long extended feathers in the tail of the cock bird. It is a pity that such a lovely creation should be so destructive to so industrious and useful an insect as the bee.

Estival apiary is the property of Mr. Eneas Walker, Redland. Mr. Walker is an instance of the man of education becoming so enamoured of a hobby as to almost neglect everything else. There are many such men connected with bee-keeping,

both in Australia and the Old and New World, for bee-keeping is a fascinating pursuit. It is a pity that it is not more profitable, for, whatever may have been the case a few years ago, the solid fact now is that it is easy enough to produce honey, but it is very hard to sell it, even at any price, remunerative or not. Like most bee-men, Mr. Walker is his own carpenter. Of course he adopts the modern hive with its interchangeable frames of comb. The size of hive is the Langstroth, now almost universal. By way of parenthesis I would here say that I have two makes of hives in my small apiary of twenty-five colonies, one the Langstroth, and the other the "American," 12 x 12 inside measurement, and I always get better results from the latter. In all there are 180 colonies at Estival, but a considerable number of these are nuclei—that is, small colonies of two or three frames of young bees and larva taken from a strong colony and allotted a pure Italian queen, for the sale of such nuclei and queens is a speciality Mr. Walker goes in for more than the production of honey. He is a regular importer of Italian queens from Italy, and is daily expecting a consignment of eight. Queen-rearing is therefore a speciality of Mr. Walker's. Now the trouble of the queen-rearer is that, when there are many hives in the apiary, the virgin queen, who on the third or fourth day of her existence flies abroad on her bridal tour, a young giddy creature, excited and nervous regarding the consummation of her desires, may not sufficiently note which hive she has left, and upon return may enter the wrong one, with the certain consequence of being stung to death. Mr. Walker's observations showed him that it is the angle the face of the hive presents which is the chief point impressed upon the bee when marking which is its own home. "You may," he told me, "move a colony a few feet to either side, or backwards or forwards, and the out-flying bees will not be puzzled to recognise their home; but only turn the face of the hive a quarter turn round, say from facing north to north-east, then the out-flying bees will be for a time completely nonplussed." He therefore designed his apiary on such a plan that not one hive fronts exactly the same point of the compass as another. The total number of hives is 280, and this is quite enough for any one locality, for the range a bee can fly over seldom exceeds three miles, and honey often gets very scarce on such a limited area. When bees are impelled to fly further to search for honey the losses that occur on the journey are very great. It is better therefore for a bee-keeper to divide his apiaries than to have too many colonies at one place.

Each of Mr. Walker's hives is placed on a neatly-cemented floor raised 2in. above the ground. This floor is made to do duty as bottom-board, and the entrance V is shaped in it just as in the bottom-board of the Langstroth. There are advantages in this cementing, for no weeds grow, it is damp-proof, clean, and does not rot, neither can ants eat it.

The evening that I visited Estival Mr. Walker had just mastered one of those extraordinary circumstances which now and again surprise the bee-keeper. The day had been close and hot, especi-

ally the early morning; in fact it was last Friday week, the first day after the first rains. Whether this close heat had anything to do with what occurred I don't know, but I mention it as possible. However, a swarming fever spread through the apiary, and Mr. Walker, as one hive after another poured out its living stream, thought the whole apiary was in the throes of revolution. Finally they settled in one gigantic mass. Aided only by Mrs. Walker, the owner of *Æstival* subdivided this mass until he had picked out no less than twenty-four queens; then, choosing the five best, he allotted the commoners amongst them. Mr. Walker is one of those bee-keepers who disdain gloves and a veil, but he did not go and have his portrait taken that night. "Next morning," he writes me, "I found one other queen at the same place, with a cluster of about a dozen bees round her; there therefore must have been no less than twenty-five swarms issued the day you visited me. Of course a great number of the bees that came out went back to their old hives when they missed their queens, which I had captured. I expected a frightful slaughter among the mixed hives next morning, but there was very little indeed—chiefly caused, I believe, by the great care I took that none of the lots had two queens with them to start the fighting. I had a similar experience last year with seven swarms (my stock then being between fifty and sixty), and in putting them up I happened to leave two queens in one lot. Next morning it was quite a case of the Kilkenny cats, as very little more than the two tails were left, in the shape of one queen with a very small company of bees—more than four times the number of bees in the hive being piled up dead in front; they must have been very busy all night."

It would be interesting to hear from other bee-keepers if they have ever experienced a similar occurrence, or whether they consider this the "boss" swarm on record in Queensland. I would add that Mr. Walker informed me his colonies were and are very short of honey. Perhaps that had something to do with it.—*Queenslander*, December 15th, 1888.

VALUE OF COMBS.

PRACTICABILITY OF SAVING THEM FOR SEVERAL YEARS' OPERATION.

Written for the (*American Bee Journal*) by
A. E. MALEY.

MR. NEWMAN:—I send you the following article which I found in our country paper, and think it worthy a place in the *American Bee Journal*. It is as follows:

It has long been a question with bee-keepers whether honey-combs could not be used for repeated filling, thus saving much time to the busy insect. A correspondent of the German-town *Telegraph* considers the question as completely settled, for he has thoroughly tested the experiment in his own apiary. He says: A bee-hive should contain about 1,800 or 2,000 cubic inches in the brood-chamber, which will

require $1\frac{1}{4}$ pounds of comb to fill it (if properly arranged as the bees will do), this being a fact as every one who knows anything can testify. It requires at least 25 pounds of liquid, sweet or honeyed case may be, to make the $1\frac{1}{4}$ pounds of comb, which it also requires at least 15 days' time for a good colony of bees, to gather and secrete into wax in order to build the combs from, which is to supply the brood-chamber. It is also a fact, not successfully controverted, that a good colony of bees, say 20,000 strong, will gather at least 8 or 10 pounds of honey in a day if the honey season is a good one. We have often had them gather double that amount in a day.

At first thought, those who think but little about the true value of combs can hardly believe that it takes 25 pounds of honey for the bees to produce a pound and a quarter of comb, yet this statement is true, and any one who can figure will find that bees will store at least 100 pounds of nice honey in a season in combs given them to start with, and not compel them to use up the best and most valuable honey for making their combs.

We have often contended, and are still of the opinion that the best honey is gathered about the time that fruit blossoms come out, and especially when the white clover and other earliest blossoms are in full vigor, which is usually the time our bees here in the North do their swarming.

They are too often placed in an empty hive or gum to build new combs and shift for themselves or, as it is usually called "luck," while we are very sure the old sinner "luck," has for many years been a failure.

As before stated, the first honey is our best, and in order to procure the best we must save our combs from colonies that may have died, or in some other way left their hive, which is done too often by spring dwindling. These combs are truly valuable to the bee-keeper, and can be turned to good account by saving them for another year's operation. Do not melt them up for wax, for surely there is but little pay in the wax to the producer at 20 or 23 cents per pound, while the combs in many instances can be turned to good account by giving them to the bees, which will soon fill them with the best of all sweets—that of honey—which you can with very little expense extract and return the combs to the bees for refilling, and thus make a saving of at least 100 pounds of nice extracted honey, worth, as a rule, 15 cents per pound.

"We know whereof we speak when we state that in the year 1882 we took from one colony of Cyprian bees 718 pounds of nicely extracted honey, which netted us 20 cents per pound; this we could not have done had we not saved our best combs and used them as before stated, saving both time and honey in the early part of the season, giving the bees the full benefit of a splendid honey harvest. Again let me say, look well to your bees, and they in return will richly repay you for all the trouble you may be at in their care. Time in bee-keeping may be as valuable as in any other calling on earth, and he who will heed its demands must expect to make slow progress."

Auburn, Nebr.

WHY SOME BEE-KEEPERS PREFER BLACKS TO ITALIANS.

JAMES A. GREEN SUMS IT ALL UP.

Until three or four years ago it seemed that the superiority of the Italians over the common bee of our country, variously known as the black, gray, brown, or German bee, was conceded by nearly all who had given them a fair trial, especially in the production of honey as a business. Within that time, though, some of our most prominent honey-producers have declared that they prefer the German race to any other race in its purity, while admitting that a cross between it and the Italian is an improvement. Some of their reasons for this preference are old, while others are the result of new conditions by which all bee-keepers are not influenced. Those who are not, may do well to consider these reasons before deciding to follow the example of their possessors, successful though they may be.

In the first place, I believe that nearly if not quite all who prefer the black bee and its crosses are producers of only comb honey, or, at least, advocate the securing of most of the crop in that shape. That the Italians are superior for extracted honey, is, I think, unquestioned. The apiarist, then, who expects to produce principally extracted honey, need interest himself no further as to the comparative merits of the two races, as it is conceded that the Italians are better for him.

Two points of superiority are broadly claimed for the black bee. First, that it will more readily enter the surplus receptacles, especially if not close to the brood. Probably there is some truth in this, or it would not be so strongly insisted on; but I have never observed any difference worth mentioning; and with proper management I know there is practically none whatever.

Second, it is claimed that the blacks produce whiter comb, which will be more desirable, and in these times of close competition will sell better than that made by Italians. Without stopping to argue whether good taste would prefer a marble white to a white just tinted with cream, I will say that, in my humble opinion, to claim that any honey ever produced by black bees would present a more saleable appearance than some I have been taking off within the past few days, made by yellow Italians, is to make a hypercritical distinction which is entirely imperceptible to the general buyer. Of course, there is a difference in this respect. I have had Italians, all of whose honey had to be graded as No. 2, at 2 cents per pound less than that of colonies alongside, just because of its dark and watery appearance, due simply to the way it was capped. Such queens are promptly superseded. Whiteness of comb stands high in the list of qualities for which I am breeding, and its realization is much more desirable than yellowness of bees, though I am working for that too.

The two points referred to are the only ones in which the blacks may be fairly claimed to be superior to the Italians under ordinary management. When we consider their positive defects,

the Italians easily bear off the palm under such management. With certain systems of management, though, these very defects of the blacks are so utilised that they become aids to manipulation.

The black bee is easily frightened, and readily driven off the combs by smoke or other means. They are also easy to shake from the combs. In handling "hives instead of frames," a system that must come more and more into use these qualities are valuable; and, if the frames are not so easily handled as the ordinary style, highly desirable. Their regard for the queen is much greater, and all points of their behaviour toward her more marked, making it easier for an expert to judge of the condition of the inside of the hive by the appearance of the outside.

The blacks are not so liable to fill up the brood-chamber with honey, thus crowding the queen. This is a very desirable feature when contraction is practiced. This very quality, though, is apt to bring them out in the fall with an empty brood-chamber. Some consider this an advantage, though I think most would prefer bees that look ahead a little more, and do not require to be fed every fall. Of course, if the fall honey is not suitable for wintering, which is probably the case at times in some localities, it is best that there should be as little as possible below.

To sum up, if you are producing comb honey exclusively, on a large scale, practicing contraction, handling hives instead of frames, and wintering on sugar, blacks *may* suit you best; but under other circumstances, and for an 'all-purpose' bee, the Italian is preferable.

JAMES A. GREEN.

Dayton, Ill., Sept. 25, 1888.

—*Roots Gleanings.*

SECURING COMB HONEY.

F. A. SNELL.

To secure a good yield of comb honey in good marketable shape, many points have to be looked after. The first essential is a good hive. The second is a good strong colony at the opening of the honey season. Free communication between brood and surplus departments, also on one side of the surplus receptacle to the other under every row of sections, and when sections are tiered up free passage from bottom to top rows. The sections should in all cases give a bee space between outside sections and the inside of case. The first sections put on should, we think, have partly drawn combs to induce an early start in the surplus department. All sections later put on should have full sheets of foundation. By following the above requirements we get our sections very nicely and evenly filled so we have no trouble in crating. If no bee space is given on the outside sections at top and bottom very many of such will be poorly filled on the outside and unfit to sell with otherwise nice sections. We use no honey board of any kind, and have no use for such. The queens hardly ever enter the surplus department—not to the extent of one per cent. This is probably owing to the depth of the frame,

which is one foot. We have tried sections in width from one and a half to two inches in width, and are now using them one and three-quarter inches, and we think we shall make no further change in that direction. With those two inches wide, the cells being so deep that the honey is not soon ripened ready for the bees to cap. Another objection is that when the flow of honey is moderate the bees will start pieces of comb between the sheets of foundation, which is a nuisance. It seems to be their nature to build thinner sheets when the yield is light in honey. During a good honey flow of clover or linden, we have had no trouble in that direction. With one and three-quarter inch sections honey ripens quicker, it sealed sooner and the comb is in a small section at least, in better proportion.

—*Beekeepers' Magazine.*

REQUEENING AFTER A SWARM HAS ISSUED.

This year more swarms than commonly have issued in the Bay State Apiary. Not caring to have so many old stocks queenless several weeks, all were requeened as soon as possible after a swarm came out, but no attempt was made to do so in less than three days after the swarm issued. The cells were removed to nucleus colonies, and at the same time the new queens were introduced, and so far not one queen has been lost. Thus it will be seen that only three days were lost to the bees in brood-rearing.

It is not so important to re-queen immediately later in the season as at the first of it. Our bees commenced early in June to gather honey, and swarms soon began to come out. Well, now, had any colony been left to rear a queen the bees would have at the end of four weeks begun to diminish in numbers, and before harvest ended there would be hardly half as many bees in the hives as there were when they swarmed. When a colony is promptly requeened there would be no great difference so far as numbers are concerned.

I am not a believer in contraction of the brood-chamber, nor do I believe in taking away the queen from a colony for any great length of time at any season of the year. Experience has taught me that a colony is always in the best condition that has a good queen, combs full of brood and plenty of young bees. A hive barren of these important requisites is nearly worthless, and unless a queen is soon put in it will be useless for any purpose.

Keep the colonies supplied with strong, healthy queens. If a queen fails to keep the combs full of brood whether there is forage or not, pinch her head off and get another. It does not pay to nurse up a colony having an unprolific queen.—*American Apiculturist.*

BEEKEEPERS' CALENDAR FOR MARCH.

This is considered the last month of the honey season, and therefore the inexperienced should be careful not to extract the hives too closely, so as to leave the bees short of stores at a time

when there are few flowers in bloom. Where hives have been worked for comb honey in section-boxes it will often be found at the close of the season, when the last crate of boxes is removed, that the brood combs have been filled solid with honey. In such cases it will be beneficial to the colonies if some of these heavily-filled combs are removed from each hive, and empty combs and combs of brood returned in exchange. The honey combs that have been removed should be given to any colonies that are deficient in stores. There is no better plan of feeding starving colonies of bees at any time than by introducing frames of sealed honey. When this is done in the evening there is no danger of starting the bees robbing.

During the season we have tested several different bee-smokers, and have come to the conclusion that the "Quinby" is the most satisfactory of all. The fuel used was partly decayed wood, and this split into sticks and placed in a Quinby double-draft smoker having a fire barrel two and a half inches in diameter, left nothing to be desired. The objection to many smokers is the difficulty starting the fuel burning, and this is owing to the want of draught.

On the other hand, in the Bingham smoker, the draught is too good, so that a fierce fire is caused, which consumes the fuel too rapidly, and sparkes are driven out with the smoke. The smoker being used more frequently than any other implement in the apiary, it is important to get a good one, as there is nothing so annoying to a beekeeper than to find that just at a critical moment there is no smoke to be had. The fire barrel should not be less than two and a half inches in diameter nor more than three inches.

In a recent number of *Gleanings in Bee Culture* there is an excellent illustrated supplement containing sketches of the hives of some of the most eminent beekeepers in America. The engravings, which are copied from photographs, are exceedingly well done, and all who are interested in the men who have assisted to bring beekeeping to its present state of perfection should make a point of seeing this number. Perhaps one of the most interesting chapters is that giving the life of Mr. Langstroth, the inventor of the moveable frame hive, and who is still alive, although in feeble health.—*From Garden and Field Adelaide.*

CARNIOLAN BEES.

Dr. Morrison, writing in the *American Bee Journal*, speaks thus of Carniolans. The most notable trait about them is their freedom from a disposition to rob and the vigilance in guarding their hives. With 200 nucleus colonies, daily exposure of their combs and a poor honey season, it is remarkable he had not a single colony robbed. Such freedom from robbing he had never known when he had Italians. He is convinced Carniolans are better honey gatherers than Italians, Cyprians, and Syrians, and as for their gentleness, he has little use for smokers, and many colonies can be handled with the same impunity as so many flies.

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Editorial.

HINTS FOR MAY.

The continued dry weather in the more southern parts of Australia has very much diminished the autumn honey harvest, and in many localities the bees, instead of filling up their unfinished sections and nearly empty frames, have looked about for chances of getting "other people's honey," with the result that in many apiaries half the stocks will not have enough store to carry them well through the winter months.

During May, at latest, therefore, a careful examination of all hives should be made, and such as have not ample provision should be fed quickly with honey, or, if that is not available from a trustworthy source, with syrup made as already directed in this Journal, but with $2\frac{1}{2}$ lbs of sugar instead of 2 lbs to each pint of water, not forgetting the tartaric acid, and boiling for 10 minutes to a quarter of an hour.

A rule, hives will now be less populous than in the busy season, for the losses by death of old bees are not so fully made up by the hatching of young ones as earlier, if, therefore, it is found that the frames are only thinly covered with bees, or that some are well covered, while others are occupied by a few stragglers only, a division board should be inserted so as to reduce the space to be occupied to four, five or six frames, and placing the empty or nearly empty frames on the other side of the division board, or remove them from the hive altogether and place them in some safe place away from mice and ants ready for use next spring; but we find it just as well to keep them in the hive. By adopting this course we keep the bees together more, more warmth is maintained, and the queen is more likely to continue laying close up to the very cold weather than if the bees straggled over a hive full of empty combs. Now about covering bees up for winter; although enamel cloth has been found admirable through the summer, we advise changing it now for a more absorbent and pervious material. Taking as a guide the experience we mentioned in our

last number (page 68), that the bees persistently lifted up the enamel covers about $\frac{1}{4}$ inch above the frames by numerous little pillars of wax, so as to secure a free communication over the top bars, we advise slatted honey boards, with tin or wooden strips at the end that will raise it say $\frac{1}{4}$ of an inch above the frames, over which must be placed the mats of canvas, bagging, or other material, which should be sufficiently thick to keep the brood nest quite warm. With a free passage over the top bars the bees are much more contented and do not bite the mats away so much as when they lie close on the frames. Of course weak stocks should be united to stronger ones, and queenless colonies to others having a queen, but it must be remembered that uniting is not so simple a matter at this season as during a honey flow. By first thoroughly smoking both hives, and if they have little or no honey spraying them freely with honey or water before uniting, then placing the frames of one hive alternately with those of the hive to be retained, and finally, smoking liberally, success can generally be attained without any fighting, but if fighting is commenced a free use of the smoker, repeated as long as fighting is seen, will generally settle matters. It is very probable the chloroform method described in our last number (page 72) should be found useful and safe in uniting stocks so late in the season. If either of the stocks possesses a valuable queen it will be well to cage her till everything is quiet in the united stock, indeed if queens are scarce it will be safest to do this in every case. It will also be well to clear away from the top of the frames any pieces of comb or lumps of propolis, and to look carefully for foul brood, for although it will be too late to adopt the method we have advocated for its treatment, a certain help is given to the stock by removal of any frames containing foul brood or dead larvae, and feeding with syrup pretty freely, for very little breeding goes on in the winter months, and the disease does not therefore increase; immediately breeding commences in the spring, however, the bees must be transferred to a new hive with new clean frames as recommended. If,

however, the disease has a good hold of the colony, and it is weak in bees, the best course is to destroy the bees with sulphur, and burn all the frames and combs in a strong fire. Where it is necessary to make such a sacrifice as this, and it is sometimes the best policy to do so, the wax may be saved without risk of infecting other bees, in this way; before opening the hive after suffocating the bees, have ready a large pot or copper of boiling water and plunge each frame in immediately on taking it from the hive, the wax will melt and float while the honey and refuse will mix with the water which, being boiling, will kill all germs. The chief danger is allowing robber bees getting at the honey in the combs before it is scalded in the water, for if they do other hives are almost sure to be infected.

CRYSTALLIZED HONEY.

A correspondent asks us how to keep honey in a liquid state, for he finds his crystallize and get solid in about three weeks?

When honey is first stored in the combs by the bees, it is very liquid, and can be easily drained out or extracted, but if left in the combs for a little time it thickens, and as the beekeepers say, gets ripe, when the bees at once seal it over. If this honey is extracted soon after gathering, and while it is very thin it is apt to ferment. So that the bees knowing this, wait till it is ripe before sealing, which prevents further loss of water by evaporation, for if evaporation were to continue after the ripe stage, it would become solid in the cells. Unripe honey goes sour; over-ripe honey gets solid.

Solid and crystallized honey is the richest and generally the purest. Nevertheless, there are several kinds of nectar-producing trees, notably some of the white and yellow box eucalypti and other river-side gums, and many shrubs which supply honey that seems never to crystallize. To imitate this kind of honey our bogus bees manufacture a sham material, which will not crystallize, with a small percentage of honey and a large percentage of a crude mixture of glucose and gum (or dextrine as it is called by chemists), the gum preventing any thickening or crystallization, and makes the compound about as fluid and soft, and about as nice as castor-oil. Some honey crystallizes very readily, and if we leave the extraction till the autumn, we generally find it solid in the cells, so that if we know that our bee forage produces *quickly crystallizing* honey, we must not leave extraction too late. But how about keeping honey fluid? This is not an easy matter to do. Of course it can be done by blending with Corn Syrup as our adulterators do, but no beekeeper would descend to such a fraud. Honey solidifies because the water which kept the sugars in solution has evaporated, and the colder the weather the quicker this takes place. More water or more warmth would prevent it, but here lies the difficulty. How much water should be added to keep the honey fluid in all ordinary temperatures without running the risk of fermentation? This cannot be answered exactly, because no two

samples of honey will be alike in this respect. The best way will be to experiment. thus: Take a pound of solid crystallized honey and put it in a vessel in a large saucepan of water, and place it on the fire till the water boils, the honey will quickly liquify, when a small wineglass full of pure water should be stirred in thoroughly, remove the honey from the saucepan and boiling water, and continue stirring till nearly cool. Then place the honey in a cool place for a day or two. If it does not recrystallize, that will be about the proportion of water to use, but if it does, repeat the process with another small glassful of water until it is found the honey will remain fluid. Of course it will keep fluid with less water in hot than in cold weather. Some honeys are found which will crystallize when so fluid that they rapidly turn sour.

In some samples of crystallized honey fluidity can be permanently restored by simply heating it as directed above, without the addition of water, and such a course should be tried before restoring any of the water lost by evaporation.

It must be remembered, however, that although little harm is done to honey by simply liquifying it in the water bath, as described, it will lose some of its aroma every time it is so heated, and if the heating be continued long, or is often repeated, the honey will lose much of its flavour.

It sometimes happens that honey crystallizes in the comb in the sections, or in the frames; such combs can be saved for feeding the bees, or if desired it may be got from the combs if they be new ones, and have not been used for brood in way. Place the honey-comb, cut up small in a tin vessel with tapered sides, a cone-shaped vessel in fact; place this vessel in a deep billy of hot water, and place it on the fire till all the comb melts down, when after cooling the wax and honey are easily separated. Combs that are dark coloured from brood raising must not be treated this way, for the honey will be badly discoloured by the brown stain of the cells, which is really composed of the accumulated excrement of all grubs that have hatched out. For the same reason honey extracted from brood combs is never of a good quality, as it is turbid and dirty. No combs used for brood should ever be extracted if first-class honey is desired. We wish it to be clearly understood that we do not advocate diluting honey to keep it fluid; but if it be required in that state, the restoration of a little of the water which has evaporated from it is quite a legitimate operation.

It is curious to find that what used to be considered a true mark of purity in honey in European and the English markets, namely solidification in cold weather, is here regarded as a sign of adulteration. The famous Narbonne honey was never bought unless solid. Solid honey cannot well be adulterated honey, and is generally the purest, richest, and best; for all this we still find purchasers who refuse crystallized honey, because they think it is adulterated with sugar, the real fact being that the buyer of crystallized honey gets more for his money. Honey consists of two kinds of sugar, with about one-fifth to one-sixth of its

weight of water, combined with a little acid and some aromatic principles which gives it its special flavour. In crystallization, no alteration takes place, except the loss of a little water by evaporation.

QUEEN BEES FROM EUROPE.

To send a queen bee from England or other part of Europe all the way to Australia at first sight appears a somewhat hopeless proceeding. In order that she may exist at all beyond a few hours it is absolutely necessary she should be accompanied by a number of worker bees, and to box them up without a chance of a flight for 30 or 40 days seems to be merely boxing them up to die. Nevertheless queen bees are arriving in Australia from various parts of Europe every spring and summer, although the number of deaths on the voyage are often large, and probably not much over 60 per cent. reach their new home. We think it is quite possible to materially lessen this large mortality among voyaging queens by profiting by the experience of Australian consignees. It seems to be insisted among beekeepers in the Western world that the farther they have to send their queens, or in other words, the longer they are to be kept prisoners the more bees and food there should be, and so miniature hives with hundreds of bees and combs full of honey, were thought necessary for the voyage, but the latest arrivals from Europe where the loss has not been more than 20 per cent. have shown such a course to be a wrong one. For example, two years ago we ordered from England 3 Cyprian and 3 Carniolan queens, these were sent out by a quick steamer, and arrived in 37 days from London. The queens were each placed in a small hive with 200 bees and 2 frames of honeycomb each, and a sponge for water supply, and ample ventilation. On opening the first two all the bees and queens were found dead; in the third a Cyprian queen and about 6 bees were found alive; in the fourth and fifth, queens and every bee dead; and in the sixth, a Carniolan queen and about 50 bees were alive and comparatively vigorous. The cause of this mortality we attributed to the bees having got wet by the careless and over abundant supply of water to the sponge boxes provided for the purpose. Many bees had been actually drowned and become putrid, and so poisoning the whole hive. In one or two compartments the honey had leaked out of the combs and smeared and finally smothered every occupant of the compartment.

A second consignment was from Mr. Benton, the well-known queen breeder in Austria. He sent out four Cyprians in a small box of four compartments, each compartment had a small frame of honey and a store of *Good Candy* on top of each frame. Three out of the four were dead with nearly all the bees. The fourth was alive and vigorous. The loss here was attributable to the honey dripping from the combs, and smothering the bees on the floor of the little compartments. There were wax moths in each compartment, and some moth grubs in the combs, these may have brought about the leakage of the honey which killed the bees.

A comparatively recent consignment to an apiarian in Sydney, also from Mr. Benton, arrived with the loss only of one or two worker bees, these were packed in the small Benton's box, 4ft. x 1½ ft. x 1ft., described in our last number (page 68), with only a dozen bees each, and solid food (*Good Candy*). So that we may conclude that queens will travel safest in a small cage with only a few, but *young* bees and supplied only with food that will not get fluid and besmear both cage and bees. If this be so, and it seems to be, it greatly simplifies the packing of queens for a voyage, and should lead to a freer importation of choice stock.

Original Contributions.

THE RAILWAY BLIGHT.

After the farmer, horticulturalist, dairyman, or apiarist has overcome the forces of nature and successfully subdued the enemies which on every hand rise up to oppose him, and has won a crop from the earth—there is still waiting for him a more subtle and insatiable foe—who at the last moment demands a toll upon his labours, and also elects what form or quantity the demanded contribution shall take. This *Microbe* has come to be known and recognised at Spencer Street as the *Railway Blight*, and appears to be somewhat allied to the *Take-all* of South Australia, differing only from it in the fact that not all is taken but a sample left to swear by or swear over. All those whose needs compel them to send any eatable articles to a Melbourne market, before many trials, discover that the much vaunted railway management of Victoria is a fraud and a delusion, and that lest the Commissioners should, by reduced rates, be too lenient with the country producers, the annexing fiend endeavours to equalise matters by frequent sampling of goods in transit and in store. There are a few lines on the goods schedule on which the Commissioners bar responsibility, legally or not. Among these come chiefly eatables, honey amongst other things. Honey forwarded in kerosene cans is frequently insecurely packed, and much leakage occurs, to which the floors of the goods sheds testify; but the shipper, by goods trucks, who carefully cans and cases his honey finds the same leaks at their delivery at Spencer Street, with the simple difference that a case or can of honey, carefully packed, appears to denote to the knowing ones a good sample and leaks more liberally than one over which little care has been taken. Section honey being somewhat of a novelty suffers largely from *Railway Blight*, and when I can succeed in getting a parcel clean through without any loss, I am going to present a sample dozen to the Commissioners to celebrate the fact. With comb honey the trouble does not end by loosing a few sections, but the finger sampling not only spoils the look of the combs but causes the released honey to run over the packages, and so sensibly decreases their market value.

Seeing so many examples of this dreadful blight and hearing such accounts of it on all sides, I

fancy that it must be a good thing to find employment in the railway department, and so be on the other side of the hedge. We may thus be able to account for the great number of applications for office which are made when the Commissioners advertise for an increased staff.

All jesting apart. Is it not nearly time, Mr. Editor, that someone moved in this matter, for the further continuance of wholesale pilfering (it is far too mild a term) is unbearable. The responsibility should be cast upon the shoulders of someone. As the matter stands no parcel of fruit, game, honey or other goods, which, by the use of tools, can be opened and contents broached, is safe, and the better and finer the samples the more risk of loss.

L. T. C.

THE PRESENT HONEY MARKET IN MELBOURNE.

Market quotations given through the newspapers report:—Honey-market dull, 3d. to 3½d. Having had occasion to go through the markets several times during the present month, I have had opportunity of knowing what stocks are on hand, and also know from other and various sources what stock is being held in the country. There is very little first-class honey offering in Melbourne, and the apiarist who uses the extractor has little fear of realising anything below 4d., at which price it will pay him to produce honey. The very best sample of box honey procurable is fully ½d. lower in value to the same honey extracted. Color is bound to count even against flavour in many cases. There are large quantities of dark and discoloured honey offering, which has come from box hives, the producers of which look upon its sale as all profit, and this sample apparently bears down the market to the quotation above given; but a good, well-flavoured sample will soon find buyers. Unfortunately, a quantity of stock on hand is such as should never be sent to market. The flavour is simply nauseous. No one would desire for a second helping from such a sample. It might be good enough to feed back, but, for human consumption, it may well be let alone. The old leaky kerosene can, while being a handy and cheap vehicle, and sometimes the only one procurable, needs improving upon. If used for honey, great care should be first taken to thoroughly cleanse and also securely solder any weak or doubtful spots. The apiarist who wishes to secure top prices, and come again, had better arrange to spend some money in a better and handier class of tinware, and also spend some in printing.

The market for comb honey has been somewhat uncertain—prices unsteady from two or three causes. Some producers having secured honey in this form for the first time, and, on a good flow, have, through ignorance, sold much below value; the grocers using the occasion to make a cut of the price, but this will soon find bottom, and the sellers learn wisdom when they look for sections to be filled in less favourable seasons, and find the bees won't oblige. There is another reason which

should not exist which tends to lower the market: Producers of comb honey, who know their business, having a good stock on hand, not willing to wait for the market to ease, but push on stock at reduced prices to secure the market. There is not the slightest need for this. Melbourne will absorb all the comb honey that comes into it, and will pay a good price for it, but does not want comb honey while fruit is in abundance and appetite somewhat fastidious at the close of a long dry spell. Sellers should wait for winter and not demand to turn stock into prompt cash as soon as it is taken off the hives. A beekeeper needs a storehouse—and a good one—as much as anything else, and needs to watch his market the same as the stock breeder.

From what I know and have seen of the markets of this season's crop, I am sure that no beekeeper using the extractor need fear the competition of the lines quoted in the daily market reports. Another thing: Unless the amount produced and to be sold amount to tons, there is no need why it should come to the Melbourne market at all. With a little time and trouble spent, a local market may be easily and readily made by any one running from ten to forty hives, and a price secured which has no deductions by loss of weight in leakage or *Railway Blight*, no commission on sales, and no freight paid.

Yours, &c.,

L. T. C.

March 21, 1889.

THE HONEY SEASON.

The honey crop of the present season has been very varied. In parts of the country very heavy flow early in spring, in others heavy in the summer, and in some parts a very heavy yield still coming in. The quality of the honey is also very varied.

The western districts of Victoria have had a very good flow all through the season, which has not come to a close yet. The quality good, a heavy dense honey of good flavour and not too sweet.

The north-eastern district has also yielded well, principally from red and yellow box, red gum, stringy bark, and peppermint.

Gippsland for this season has been behind; except in patches white clover has failed this year as a honey producer, on account of want of rain. A good quantity of honey has been gathered in the south west of Gippsland, but the quality is not much to boast about, being strongly flavoured from tea-tree, or other flowering shrubs, with strong aromatic flavour, and inclined to bitter leaving an unpleasant taste in the mouth.

Correspondence.

To the Editor of the Australian Bee-keepers' Journal.

As it is now about six months since I started the Apiary for the Victorian Bee Company in the Grampians, will you kindly permit me to tell the

readers of the *Bee Journal* how I have got on since. I should have written sooner, but when the bees had the swarming mania I could not find time to do so. On Monday, Sept. 10, I proceeded by train to Dunkeld, and from thence walked to the range on purpose to mark out the site for my future residence, and workshop. I remained there a day on purpose to get the ground ready for the hives. The following Friday, Sept. the 14th, I went there again with the first lot of stocks, 11 in number. It was a very warm day, and although I had the hives secured to the best of my knowledge, no sooner were the hives on the lorry, and the wheels were crossing some rough metal, than some of the joints in the oldest hives opened just wide enough to permit the escape of bees. They embraced such an opportunity, and let the driver and the horses know that they did not want to be served like that. The horses had to be taken out, the bees unloaded, better secured, and put into the railway truck. The Hamilton station-master, who always was very kind, said to me before leaving, "At Dunkeld this truck goes to the good shed, and then you may unload the bees at your leisure." But this did not come true, for when the train arrived there, the guard said to me "I am going to take this truck on, so you better get your bees out as quick as you can." What could I do but to obey orders. As the hives were in the truck nearest to the tender, I had to take them out at the far end of the platform and set them down until the train was gone, and when the lorry arrived lift them again, and carry them by myself all the way to the gates. But with the next lot I managed things differently. This was on Sept. 19th. I took fourteen hives, and sent a telegram to B.B. Agent at Dunkeld, so that the lorry was at the gates at the arrival of the train; so this time I only took the hives out of the truck on to the lorry. On the 27th I took the last eleven and all went well. Oct. the 10th I had the first swarm. Oct. the 11 I had a swarm given to me which I hived and took home to the Company's Apiary. Tuesday, Oct. 16th, I had the first Cyprian swarm from hive No. 27. Tuesday, the 18th, I commenced burning up the scrub, to save ourselves from bush fires. Friday, burning still. When inspecting the bees I found the ants were very troublesome, and were tormenting the bees. The ground here is literally covered with large black ants. I was in great anxiety what was best to be done to get rid of them. I found that I had at once to dispense with the alighting board, and to paint the projecting part of the floor board with tar on the lower edge; indeed the ants took me almost more time than the bees. I made great fires on the ant hill, but all to no purpose. At last I got hold of a good thing, and I destroyed millions of them in this wise. I got some loose bark from the messmate trees, and thoroughly saturated it with kerosene, then I put my big top boots on, and gave them a thick coat of Stockholm tar. Now I went to the ant hill, and trampled on it to get them all out of their domicile until the ground was quite black with ants. This done I threw down the bark and put a match to it, and when they wanted to make their

escape, with an iron rake I drew the flames over them. By this method I killed a great many, but still they remain very troublesome, and my firm conviction is that they will have to be extirpated altogether. Some of the natural swarms put me to a great deal of trouble; for as the hill on which the apiary is is entirely denuded of timber, whenever a swarm issues it crosses the fence and moves in the direction of Mt. Sturgeon. At times they fly so high that I can only follow them by the sound. On October the 26th I had just hived a swarm, then went to dinner. I had only just sat down when I heard the noise like bees swarming near the door. I looked out, and there they were whirling round and round, and as they could not find a tree or shrub suitable to cluster on, they after some deliberation settled on a big limb of a very tall giant messmate tree in the far corner of the fence, but so high that I could not reach them. Several efforts to break down the limb with a long hook I have got for that purpose were in vain. The only safe way to get at this swarm was to cut down the bough. So I set to work, but it was a very dangerous job, yet I succeeded in this way. As soon as this part began to crack I descended quickly, and was quite safe on "terra firma" when the actual crash took place. In several instances I had to cut down limbs and even whole trees to secure an absconding swarm. One day I had a beautiful swarm of cyprians take to the bush. I pursued it until it settled, but in too dangerous a position for a man of my age to climb. A neighbour of mine happened to pass that way, and noticing in what a dilemma I was, he very obligingly said to me "You get me an axe, I will get that swarm for you very quick." I brought the axe, he climbed the tree, but had only put two cuts into the bark when a bee stung him on the nose. Down he threw the axe, and he also was very quick down on mother earth. We again employed the hook but on account of the sudden jerk the bees do not fall to the ground but into the air, and therefore remain on the wing still and settle in some other place. This one swarm engaged me and my friend for several hours, and yet we did not get it. At last another thought struck me, of something I read in a German bee journal some years ago, but had never tried it. I went to a hive, got a frame with comb, tied it to a long pole, and held it just above the cluster, and in less than five minutes I had the whole swarm so securely settled that I could put it into a hive. I came in this locality during the middle of the month of September with 34 hives. I lost several from various causes, increased to 54, and have up to date extracted only about 1600 lb. I believe there would have been much more had I been able to put on supers in time, but as the Company started too late there were no funds available to get the necessary supplies, as hives, etc. The pasturage here is exceedingly good, and the honey very rich. The first honey in particular, which was gathered chiefly from the *grevillia silicifolia* and the *Xanthorea*, was of a very spicy flavour but of pinkish colour, but the honey we take now is amber colour, and almost too thick to be extracted. Eucalypti have been in flower since October,

some are flowering still, and the *corea* and *epacris* are blooming too, so that we are never without flowers here all the year round.

DUNKELD, March 9th.

H. NAVEAU.

News from Colonial Apiaries.

CORINELLA APIARY, BRIGHTON.

We have run through the season without obtaining an ounce of surplus, and have had to feed continually. After fruit blooms were gone there was literally nothing for the bees to gather with exception of a little honey in February from peppermint. We consequently removed about 40 stocks to our other apiaries, and have sold about 80 colonies and nucleus stocks, leaving about 15 weak lots now on hand. We have just begun feeding smartly to get these put into condition for winter, and hope by the end of April to get enough bees into the hives to pull through.

We have sold about 70 of Kangaroo Island Queens (Fiebig's) this year, and they have given complete satisfaction wherever sold. L. T. C.

WITHERSWOOD APIARY—MANSFIELD.

We closed last season with sixty large colonies with hives all full of honey.

An early inspection in the spring showed several dead out and foul brood everywhere—a very cheerful prospect indeed, more especially as we had been counting our chickens previously, and had set up any quantity of empty hives for the increase that was to come. Anyhow, there was no help for it. The remaining bees were transferred to new hives on starters, and a big bon-fire consumed the remainder; and when all was over the most that could be counted was 20 weak colonies, which were not fairly in order by the time red-gum began to bloom. A reinforcement of another 20 small colonies from our Brighton apiary helped to make things look a little better, and up to the present about 1000 lb. boxes have been well filled with an excellent sample of honey and plenty of supplies still on hand for the bees.

In this apiary we are using chiefly shallow sectional hives, with a 5in. frame, 2 sets for brood and 2 to 4 sets of section racks.

From our experience of this hive, we think there is little to be desired in working for sections, and although we are not extracting, are convinced that this small frame would be a most excellent one for that purpose, easily and cleanly uncapped.

Foul brood made its appearance once or twice since, but was promptly knocked on the head.

Our chief sources of honey this season have been white clover, eucalyptus of various sorts, and thistle, the latter a late bloomer and very good for bees to fill up with.

CHAMBERS & WITHERS.

MOUNT VIEW APIARY, TALLAROOK.

A good flow of honey from red and yellow box sent things along merrily until Christmas. Sections could hardly be got ready fast enough for the

demand, but a change came over the scene after New Year work began to slacken. No more honey stored, and by the middle of February robbing began whenever opportunity presented. From that till now guard mounting at every hive has been the order of the day. We have, therefore, the pleasure of looking upon 70 good stocks of bees well supplied with stores, and carefully guarding between 2000 and 3000 partly and nearly finished sections without much chance of turning any of them into cash this year. Possibly they will be good property to begin next year with. The weather has been so exceedingly dry that all sources of honey failed.

CHAMBERS & PEDLER.

14th March, 1889.

Extracts.

PLANTING FOR BEES.

The question has often been asked. 'Does it pay?' Well, it will and it will not, as the saying is. Before the apiarist spends any money in this direction, he should very seriously consider his own peculiar situation. The possibility is that if his district really will not support his apiary, it will pay him better to move his apiary to where it will have a chance of giving satisfactory results.

But, on the other hand, a district can often be greatly improved over a term of years by the expenditure of a little time at a slight yearly cost, especially if there happen to be much waste land in the vicinity. Meadows can be improved by scattering a little white clover seed as opportunity offers. Neighbouring farmers may be induced to grow alsike in the place of, or mixed with, red clover, especially if the beekeeper is prepared to pay the cost of a portion of the same. Old corners or rough land generally can be utilised by sowing mellilot clover, particularly if it happens to be along lanes, by the roadside, or where deep cart-ruts are made over ground not actually in use. Clover is very partial to road-grit, and we have known a very heavy growth of white clover come where the grass land had been dressed with this material, and at no cost whatever for seed.

According to present experience, we should say it does not pay to *cultivate* land for bees year by year, but where it can be had at a very cheap rate, and a crop is put in (carefully, in the first instance), that will afterwards take care of itself, such as mellilot; then, without doubt it will pay well.

Small garden crops of course are simply valuable to the large apiarian for honey, but it is a pleasure to make a collection of such plants as bees appear to like, giving a small space to each variety, and we have no other wish than to encourage this commendable hobby.

It must not for a moment be supposed, however, that these patches will offer any real test for arriving at the most desirable plants to be cultivated for the production of honey on a large

scale. The very plants the bees appear most fond of are too often such as I would be utterly impossible to cultivate on a large scale, while the patch that now is neglected as a miniature crop, if grown by the acre, would be visited by tens of thousands, while the winged workers would simply 'roar' as they pass to and fro from the apiary in one continual stream.

We have then to look to what will produce honey on a large scale at the least cost in rent and labour when the desirable plant has no other use, and the land so occupied has no higher value; while those who have the means of growing crops for hay can certainly make it to their own advantage to accommodate the bees at the same time, and thus secure the best results in a double harvest. In the case of crops left for seed, there can be no question as to the great benefit and more certain profit to be secured from the flowers being freely visited by the hive bee, and so ensuring the fullest possible fertilisation of the bloom and consequently heavy crops of fully developed seed. On the other hand, when wanted for hay of the highest quality, it must be a consideration whether it will pay better to let the crop stand a few days longer for the benefit of the honey crop or be cut immediately the earlier bloom begins to fade. This is rather a delicate question, but one we should not hesitate to decide upon in favour of the bees on the one condition that the best of weather prevailed, and they were making such good use of the time as is well-known they can do as occasion offers.

We have considered the question of 'planting' in so far as it relates to honey, but while a large crop only is of use for that purpose, the quantity of pollen that is obtained from a small bed of certain plants is something considerable. Nevertheless we question if many bee-keepers really have any need to grow for this purpose, seeing how freely this article is generally brought in. Wallflowers yield pollen early in considerable quantity. Crocuses we cannot recommend, after an extensive experience, and we mention the fact as so many have thought highly of them. They come early, and that is nearly all we can say for them, as we have watched bee after bee, and have been surprised and really disgusted to note the very long time it took to get a load, contrasting very unfavourably with the work done on wallflowers and mustard, which latter we can recommend as a plant that can be brought in to suit almost any district at a time of scarcity. Rape sown during the previous autumn will give an unlimited supply of pollen from the end of April, earlier or later, according to the season, for three or four weeks just at the right time; but for the most part bee-keepers can use their own judgement, bringing into bloom what is likely to prove most serviceable at a time of scarcity, according to their respective needs, while plants grown especially for honey may, in many cases, be made to bloom several weeks longer than is naturally the case, by a judicious pruning of the fading flowers, or partial cutting of the crop, as the case may be. *British Bee Journal.*

A BIG BEE FARM.

'The most extensive bee-farm in the world is probably near Beeton, in Canada. It covers four acres, and the owner, in a favourable year, secures not less than 75,000 pounds of honey from his 13,000,000 little workers.'—*Newspaper paragraph.*

[1960.] I observe a paragraph in your last issue, under the above heading, stating that 'the most extensive bee-farm in the world is probably near Beeton (not Beeton) in Canada.' Now, I happen to know the owner pretty well, and though he is not averse to being puffed a little, I know he would at once decline the honour you would thrust upon him. I may say that the reputed extent of ground, be it 'four acres' as in this case, or 100 acres, gives no idea of the real magnitude of a bee-farm, since the bees from even a single hive, occupying it may be a space under a square yard, have a range of pasturage in all directions of about five miles; and though 100 colonies were kept in the same yard, their united pasturage would be no more extensive. The true measure of extent in an apiary is the number of colonies kept. In Mr. D. A. Jones' apiary, at Beeton, there are only hundreds kept, while in others I know of there are thousands.

I have no doubt the most extensive bee-keeper in the world is Captain J. E. Hetherington, of Cherry Valley, New York. He owns about 3000 colonies, or stocks of bees, kept in fourteen different apiaries, from two to twelve miles distant from his home. The Captain does not appear anxious to publish results, but I should guess that in a favourable year each of his stocks would yield an average of 175 lbs., in all about 525,000 lbs.

The late Adam Grimm of Jefferson, Illinois, was, in his day, the most extensive bee-keeper in the States, having about 1400 colonies, and clearing in one year from them 10,000 dollars. He died in 1876.

Mr. J. S. Harbison, of Old Mission Valley, San Diego, Cal., some years ago had as many as 3500 colonies, and it is said to have consigned as much as 130 tons of honey at one shipment. He has latterly given more attention to fruit-culture, so that probably he is not now the most extensive bee-keeper in the world.

The above are but a few names among many who own more colonies than Mr. Jones. But I cannot close without mentioning another, whose remarkable story was given lately in the *Woman's Missionary Advocate* (Am.). Her name is Mrs. Sarah Axtell, of Roseville, Warren Co., Ill., and her portrait is before me as I write, that of a worn-looking invalid, for such she is. Eager to work in the cause of missions, she busied herself in such light handiwork as suited her, selling the proceeds for that end. In 1871 she began to keep bees 'for God,' and has, ever since they began to pay forwarded the proceeds to the missions. Her stocks number 200, and her yearly returns have, on some occasions, been marvellous. For instance in 1882, from 180 colonies, 39,000 lbs. of honey were taken and that year Mrs. Axtell was able to send to the American Board of Missions 'one thousand nine hundred and thirty-eight dollars and thirty-two cents.' In six years, up to the time the article referred to was written, she had sent in all 7500 dollars, equal to £1500. Of

course Mrs. A. has the help of a kind husband and a girl, but she tells us that her own health has so much improved in the course of so much open air work that she is scarcely an invalid at all now. Such examples of devotedness are unhappily so rare that we think it well to publish them.

As to the number of bees in the Beeton apiary, given as nineteen millions, I have been asked how that can be made out. It has been proved that about 4500 bees weigh 1 lb. A good stock in summer is known to contain from 10 to 15 lbs. of bees—that is, a modern frame-hive properly worked. An average of, say, 12 lbs. would give over 50,000 workers to the hive, so that Mr. Jones' nineteen millions would be equal to about 400 stocks. Employing the same calculations, Captain Hetherington should have at one time a force of 150 millions of busy bees working for him.

The largest apiary in Scotland is, I believe, that of Mr. W. McNally, Glenluce, who owns about 130 colonies. The pasturage in this country is too sparse, and the seasons too precarious, to warrant any one in going in for bee-keeping on the extensive scale they do in America. But we have in 'Scotch Heather Honey' the richest honey of the world; and as such will always be in demand. It may be worth while for those in favourable localities giving more attention to this growing pursuit.—WILLIAM RAITT, *Becroft, January 2nd (Blairgowrie Advertiser.)*

[There is a melancholy interest attached to the above letter, which appeared in the *Blairgowrie Advertiser* of January 12. It is the latest contribution to the press from the pen of the lately deceased Mr. William Raitt. He had desired to see a proof for the purpose of verifying his figures. But before he had the opportunity of returning it he had passed away.—ED.]

BEE-KEEPING IN IRELAND.

Makers of bee hives with moveable frames by which portions of the comb can be removed, will find a good advertisement in the recently issued *Agricultural Statistics for Ireland*. The Registrar-General states that in the whole island there were 28,569 swarms at work, of which 9135, or nearly one-third, were kept in 'hives having moveable frames,' and 19,434 in other hives. The quantity of honey produced was 459,386 lbs., or an average of 16 lbs. per hive, an amount which probably exceeds what the uninitiated would consider possible. But of this total yield nearly half was gained from the new-fashioned hives, so that while the average store of a swarm kept in one of them was 23 lbs., that of a swarm living in the less commodious dwelling was only 13 lbs. It is curious to note that in Connaught, where there are less than one-fourth the number of swarms to be found in each of the other three provinces, the yield of honey per hive is considerably greater. Evidently the struggle for bee existence is less keen, for while an Ulster swarm will collect 22 lbs. a Connaught swarm will amass no less than 29 lbs. But the most productive hives in Ireland are to be found in Kildare, where 218 of the 'moveable frame' type produced an average yield of 37 lbs. of honey for each swarm.—*Daily News*.

CALIFORNIA.

Bees have ceased working for the season, as all kinds of bloom have ended. The foliage of the surrounding forests has begun to exhibit the hues and tints of autumn. The birds have gone further south for the winter. The air is no longer gladdened by the sound of myriads of wings.

The honey-bees are now housed up for winter, and every three or four days they go out for a flight, and circle around for a while, but soon return to the hive. The breeding season has now passed, although some colonies with extra prolific queens have a few square inches of brood. All careful apiarists have prepared everything for winter, covering each hive with a roof to shed winter rains and snow, and giving colonies that are in need of stores sufficient to winter on, &c. Beekeepers can now take a few days' rest preparatory to getting ready for another season's work.

It has been proved conclusively that the Italian bee is superior to the black or brown bee for honey-gathering in most locations. Having three different apiaries located twelve miles apart, respectively, I have a good chance for observation and study on this subject. I find that at an elevation of 4000 feet and upwards the black bee equals the Italian, or any of the yellow races; while at an elevation of 1000 to 4000 feet the yellow races do the best.

I find that a cross between the Italians and Carniolans give the best results when working for comb honey at any of the apiaries. A few miles make a great change in bee-locations. For instance, if it is a very wet and rainy season, the foot-hill apiary will do the best, and if it be a dry season the mountain apiaries do the best. Such has been my experience the last few years.

At the mountain apiaries there is continual bloom from the middle of February to November, keeping the bees busy the entire season. In the foot-hill region the honey sea on ends in July. I was always bothered a great deal by robber bees in the latter location. After the honey season ends, and the hot weather comes on, bees dwindle down rapidly. I lost several colonies of Italian hybrids and black bees the past season. They would not protect themselves against robber bees. The Carniolan bees did not participate in the robbing, and not a single colony of them was robbed. They are second to none in defending their hives against robber bees. In the mountains I have no trouble whatever with robbing.—S. L. WATKINS, *Placerville, Calif. (American Bee Journal).*

HOW TO MAKE AN OBSERVATORY HIVE.

One of the most interesting and instructive exhibits that can be shown either in the private dwelling or the show-yard is an observatory hive well stocked with bees upon clean and regularly built combs; these latter should have a fair amount of brood in them. Numbers of people who will pass by an exhibit of honey or appliances

will at once be attracted by living bees, especially when there is a chance of seeing the "queen;" the interest thus excited will often be the means whereby another beekeeper is added to the ranks. Many beekeepers would like to have such an object in their living rooms, having the entrance and exit through, say, a window; this in many cases can easily be arranged by an intelligent person.

We will therefore give some simple instructions how to construct an observatory hive holding four frames, and also one to hold one frame commonly called an unicomb observatory hive. This latter description is only of use where the bees have not to be confined for any great length of time, but where they have to be kept in the hive for weeks or months the four-comb hive must be used. The unicomb hive is usually kept for the simple purpose of showing the queen, attendant workers, comb, and brood, without any danger to the spectators of being stung, and owing to its limited capacity little scientific investigation can be carried on by its assistance. The bees are rarely seen in a strictly normal condition in so small a hive, and seldom it is safe to allow them to fly from it; but with the larger and more imposing four or more frame observatory hive, the bees can be kept in it during the whole of the summer months, and allowed to fly, as with any ordinary frame-hive, though no surplus can be expected from such a colony.

Construction of an Unicomb Observatory Hive.

—The whole of the material can be cut from four cut stuff, which should be free from knots and nicely planed. The two sides should be first cut out to the following dimensions and shape:—12 inches long by $2\frac{1}{2}$ inches broad at top ends, this latter size to be continued downwards to the opposite end for 9 inches; the bottom ends must be $5\frac{1}{2}$ inches broad and tapered to 3 inches to meet that portion of the sides that has been cut down to $2\frac{1}{2}$ inches. These two pieces must be clamped together and nicely finished off, that both may be exactly the same size and shape. You thus have two sides $2\frac{1}{2}$ inches broad to within 3 inches of bottom, but splayed to $5\frac{1}{2}$ inches from this point downwards. Two grooves must now be cut out of the inside of each of these sides from the top or narrow end, and continued to just below where the splay commences. These grooves are for the two glass slides to slip in. A distance of $1\frac{7}{8}$ inch from the outsides of each of these sheets of glass being allowed when cutting grooves, thus providing a space of $1\frac{3}{4}$ inch between the insides when the glass is in position. At the top or narrow ends a piece must be cut out $\frac{7}{8}$ inch wide by $\frac{3}{8}$ inch deep for the lugs of the frame to rest on, and at the bottom or splayed end of one piece a $\frac{7}{8}$ inch centre-bit hole should be bored for an entrance. A floor-board must now be cut out of the same stuff $17 \times 5\frac{1}{2}$ inches. The two sides can now be nailed on to this board at a distance of $14\frac{1}{2}$ inches from each other, inside measurement, the splayed ends just fitting the width of the floor-board.

You now have two uprights on a floor-board, these uprights having grooves in the inside edges to accommodate the glass slides. Two pieces of the same stuff must now be cut to the following

dimensions:— $14\frac{1}{2} \times 3\frac{3}{4}$, and through each, and equidistant from each other, are to be bored five $\frac{7}{8}$ -inch centre bit holes. These two pieces are to be fitted and placed in position between the two uprights, to extend from the outside edge of floor to 1 inch above where the splay commences; they will each have to have their opposite edges bevelled to fit properly in their position. Over each of the five holes must be nailed pieces of wire cloth, forming ventilators to the bottom portion of the hive under the comb. Having nailed these in position the glass can be cut out for the sides, and fitted into the grooves. The glass must be flush with the tops of the sides, and extend just below the top edges of the two wooden portions of sides in which are the ventilators. The cover is made from a piece of the same stuff $17 \times 3\frac{3}{8}$. The top side of this should be bevelled, and the underside fitted with fillets to shut right over and close to the ends and glass sides, making all bee-proof. The whole must be well glass-papered, sized, and varnished. Any kind of scentless wood can be used, and of course any description of plain ornamentation can be added. The frame of comb and bees are lowered down between the glass sides, and the lugs of the frame, which must be shortened, rest in the two slots on top of ends of hive, the cover shutting all in snug and tight. The centre-bit hole in the bottom of one of the ends is used to run any more bees in which may be required to increase the population.

To Construct a Four-framed Observatory Hive.

—These hives are usually constructed to swing round on a pivot in centre of bottom of hive, and stand so that either side can be turned to the spectator without moving the stand. We will first describe the stand. This must be made hollow for just over half its length. It can be best managed by cutting out a slot from the inside, and affixing a thin piece of wood over the slot. 1-inch stuff must be used, the slot being $\frac{5}{8}$ -inch deep. It is through this slot that the bees obtain access to the hive, thus answering the purpose of an entrance. Exactly in the centre of the stand, a $1\frac{1}{2}$ -inch centre-bit hole is made, and a piece of strong brass tube inserted, fitting into this hole perfectly tight, and further secured by means of screws. The tube must be flush with the top surface of the stand, and also flush with the underside in the slot mentioned before. The stand must be at least 6 inches broad, and extended to 9 inches in the centre. You thus have a stand with a tunnel running from one end, and having communication at its end through the brass tube at surface in centre. The bottom or thin piece of wood must not be fixed over the underside of the slot until the hive is finished. The bottom board of the hive is made from 1-inch stuff, cut to the following dimensions, $34 \times 2\frac{1}{2}$, this receiving the two sides and middle partition, which must be mortised into it for strength. Exactly in the centre of this bottom-board, a centre-bit hole must be bored to correspond with the hole in the centre of the stand. Into this a piece of brass tube is fixed, of the exact size of the inside of the pieces of tube fixed in stand, flush with the upper surface of the floor-board, but long enough to come just below the bottom edge

of the tube in the stand when floor-board is in position on stand. Into the bottom end of this tube two holes are drilled, into which a piece of wire is fixed to act as stops, thus preventing the withdrawal of the tube fixed in floor-board when hive is in position. This is the hinge or pivot which allows the hive to be turned in any position without any danger of stopping up the entrance. The sides and middle partition are made of four cut stuff, and without the tenons at end must measure $17\frac{5}{8} \times 2\frac{1}{2}$. The piece used for the centre division must have a small archway cut in the tenoned end just where it partially covers the entrance in floor-board, and on each side two grooves are cut along to its entire length at a distance of $1\frac{5}{8}$ -inch from each other, measuring from their inside edges. The two ends must have corresponding grooves cut, but only on one side of each. These grooves are for the purpose of accommodating the glass slides. The bottom board must also have grooves cut to accommodate the bottom edges of the glass sides. Eight pieces of wood measuring $8\frac{3}{8} \times 1\frac{5}{8} \times \frac{1}{4}$ must now be cut out and fixed equidistant from each other between each pair of grooves in sides and centre partition. These are for the lugs—which must be shortened—of the frames to rest upon, and form the inside surface of ends of hive. The tops of each of ends and centre partition must be braced together by means of narrow moulding tenoned into each. The cover is made in the same manner as the unicombed hive, but should have a ventilator, to be used as occasion requires, in the centre. It is also advisable to make one in each end at top, as often a colony in an observatory hive is obliged to be disturbed, and so excited, when the rise in the temperature consequent on same would be very detrimental to the colony. The glass sides are each formed of two sheets of glass. The frames are placed in position by withdrawing the glass from one side. Ornamentation can be left to the maker's taste, but should always be very plain. This hive must be made of hard wood, a soft wood would not stand the strain at the tenons.

Many of these hives are made with double glass sides, which are an improvement. Others are provided with shutters to keep out the light when not required for observation. All observatory hives must have an outside cover well lined with thick felt.

It is quite possible for an amateur to construct an observatory hive. We saw one at Felton in Northumberland, made by an ex-sailor, which answered admirably out-of-doors during the summer months. The bees must be removed into an ordinary frame hive during early spring, late autumn, and winter. None but straight combs can be used. It is advisable that these should be prepared specially between separators.—*British Bee Journal*.

THE APIARY.

EXPERIENCE OF A BEGINNER.

On this subject Mr. Herrick writes as follows:—The experience of a beginner in beekeeping is a succession of surprises. For in this, more than in any other avocation, does he find that the reality is

almost the opposite to what he anticipated. For example, he watches an experienced apiarist go into the top of a tall tree, and cut off a limb on which is clustered a swarm of bees, and carry it safely to the ground and hive the bees. He thinks that it is a very simple and easy thing to do: and so it is. But a few days later, when he essays to hive a swarm that he finds on one of his apple trees, and he becomes the chief actor instead of the spectator standing at a safe distance, the thing appears very different to him. He sees from a different standpoint. On the topmost round of the ladder, balancing himself with his knee against a limb, both arms extended, holding the limb on which the bees are clustered with one hand and sawing it off with the other, muscles quivering, the sweat pouring down his face, the bees buzzing inconveniently near his eyes, what wonder if, on attempting to go down the ladder, his eyes fixed on the cluster of bees, he makes a misstep, and "Jack and Jill" fashion, "tumbles down and cracks his crown," and the bees come buzzing after. Then, again, he watches an experienced beekeeper open up a hive, take out the frames and look them over, cutting out a queen cell here and a drone comb there, and he thinks the old man's slow and deliberate movements are due to the infirmities of old age; and he goes home full of conceit of what he can do with his bees, and how much more quickly he can do it. But after several attempts he begins to learn that old adage, "The more haste the less speed." I do not know of anything that will knock the conceit out of a man quicker than to find himself face to face with a colony of excited bees; compelled to move very deliberately while the bees are doing just the opposite, and having it all their own way with him. I know how it is, for I have been there myself. And here let me say to my young beekeeping friends, pay no attention to what old beekeepers say about never using gloves or a veil when manipulating bees. I know it is safe to wear gloves and a veil. If you are at all nervous, as most young beekeepers will be, these articles will reassure you and in any case will prevent many a sting. I do not, on any account, wish to intimate that you would care for a few stings, but, you know, it kills the bees. But there are many experiences about beekeeping that are really pleasant. It is pleasant to watch them in early spring, and learn their ways and methods. Later on it is pleasant to supply them with needed surplus storage. It is also pleasant, during the honey flow, to note from day to day the increase of honey in the sections. It is pleasant to take off large amounts of honey from each hive and sell it for a good price. And I presume all will agree that it is pleasant to eat it, providing you do not eat too much at a time. In fact, when you and the bees become good friends all goes pleasantly.—*Agriculture*.

MATS OR QUILTS.

If porous stuff like bagging be used, an opening 3 inches wide is enough in winter, if enamel cloth is used a much wider opening will be required according to the strength of the colony but never less than 5 or 6 inches.

VIRGIL AND THE MANAGEMENT OF BEES.

Classic experts unanimously place Virgil in the first rank of poets. His Georgics are by far the best of his poems, and the fourth Georgic on the 'Management of Bees,' is the most beautiful of them all. It may fairly lay claim to the distinction of being the finest poem which ever appeared. Unfortunately Virgil is usually forced at school on boys who are unable to appreciate his beauties, and his name and sonorous lines are so often associated with imposition and tears as to prevent even educated men in after-life from taking the Georgics down from their library shelves. Of course there are exceptions. The author of *A Year with the Birds*, who is my neighbour here, writes that the ability to read and understand Virgil is one of the things which make life worth living. He has devoted a chapter to Virgil's birds, and has come to the conclusion that the poet was practically acquainted with the birds he mentions.

Whatever may be said about his acquaintance with birds, it is difficult to imagine that Virgil's acquaintance with bees was otherwise than on a par with Goldsmith's knowledge of natural history in general.

Johnson, Sir! Goldsmith is about to give us a work on natural history; and although he can barely distinguish a horse from a cow, we shall have a book entertaining as a Persian tale.*

The fourth Georgic is certainly a very entertaining book for those who can read and understand it. To modern bee-keepers it is particularly interesting, as giving some idea of hive management nearly two thousand years ago; and as sugar was unknown, bee-keeping was probably a much more important industry than it is now. Of course it would be idle to expect Virgil to be acquainted with the true history of bees, and therefore current delusions regarding them, only corrected centuries later on, may pass without comment; but if Goldsmith could distinguish a horse from a cow, Virgil does not appear to be able to distinguish a humble bee from a hive bee;† and it is difficult to imagine that any one who has manipulated bees for a single season would say that tall trees are suitable to swarm on,‡ or that a swarm will invariably take possession of a hive duly anointed with certain herbs when guided to it by the sound of cymbals. Virgil does not say whether bees were burnt in his day, but, as he mentions two honey harvests in the year, and recommends the use of smoke to quiet bees, it would appear that some system of depriving the hives of honey without destroying the bees was in vogue then.

Since I set up an apiary, not very long ago, I have read the fourth Georgic with considerable assiduity; and as I have amused myself with condensing its directions to persons about to keep bees in the century which preceded the commencement of the Christian era, it may not be without interest to produce these directions here, in order that during this dull season those who have not the opportunity or inclination for

reading the original, may compare them with the directions given in *Modern Bee-keeping*.

The received translators of the fourth Georgic, so far as I have had access to their works, not being practical bee-keepers themselves, are apt to draw on their own imaginations.

Dryden, in describing the bees suffering from famine, says:—

And crowds of dead, that never shall return
To their loved hives, in decent pomp are borne;
The friends attend the hearse, the next relations mourn
which is coming it rather too strong, even for Virgil.

NOTES ON THE MANAGEMENT OF BEES, TAKEN FROM THE FOURTH GEORGIC OF VIRGIL.

Persons proposing to keep bees should select a site where the hives can stand in the vicinity of large trees, for these serve the double purpose of affording shade and alighting places for the swarms in spring.

The site also should be sheltered, for high wind obstructs the bees when they return laden to their hives, and although they not unfrequently carry little stones as ballast to steady their flight in rough weather, yet they are liable to be blown into the water, which should always be provided for drinking purposes near the hives. The best way to avert accidents is to place projecting stones in running water, and floating willow twigs where the drinking water is stagnant, for the bees can scramble on to these extempore bridges when they get submerged, and dry their wings in the summer sun.

The apiarist's numerous creeping and winged enemies must be kept at a distance. Among insectivorous birds, the swallow is particularly destructive. Give her the chance, and she will rear her young ones upon bees. Nor are these the only precautions to be taken. On no account should yew-trees be permitted near the hives, nor evil smelling swamps and mud; even a site where there is an echo should be avoided.

The most fitting situation to choose for bees is the neighbourhood of gardens where the yellow spring flowers abound, where the fir tribe flourishes, and where wild thyme, lungwort, and numerous other plants, afford a banqueting ground for the bees.

Having selected a suitable site, the hives will be the next care, and these, whether made of cork-bark or briars, must have a narrow entrance to guard against extremes of heat and cold. The bees themselves will cement all internal chinks, but the master will do well to plaster the outside of his hives with mud and a few leaves.

In the spring the hive will send out a swarm, and then the master must be on the alert, and prepare a hive scented with sweet herbs, and he must tinkle cymbals, and then instinctively the bees will take possession of their new abode.

The great secret of success is to keep the king within the hive. No race of men are so impressed with the 'Divine right of kings' as are these humble insects. So long as he is present all goes well, but without a king utter ruin falls upon the hive.

*See line 43. †See line 24. ‡See line 66.

A simple remedy to prevent the king from leaving his admiring subjects is to clip his wings.

It not unfrequently happens, however, that when the swarm issues there are two rival kings, each followed by his respective partisans. In such case a tremendous commotion ensues, and each side prepares for battle: the pigmy warriors brandish their wings, and whet their stings upon their beaks. Suddenly they charge, and, locked in deadly embrace, they fall down headlong, thick as hail or acorns from a shaken oak. A little dust thrown into the air will put an end to the combat, and then the wary master will select the best of the rival kings and kill the other. He will have no difficulty in discerning which to choose, for one has a bright burnished appearance, the other has a bloated form, hideous to behold.

The subject bees too differ in appearance. The best kind for making honey have a bright golden sheen, and are equally spotted. The other kind are unpleasant and rough-looking, like thirsty tramps who have been trudging along a dusty road on a hot summer day.

Directly the swarm is fairly established work is commenced in earnest for the common weal. Some bees are told off to gather honey in the fields, others are appointed to guard the hive, observe the weather, and receive the burdens from the comers-in. Some look after the rising generation, and a band is enrolled to expel the drones. The work goes briskly on till night, when the hive is hushed in repose. Next morning all is life and energy again; the stores are redolent with thyme. Honey may be taken twice during the year in early summer and autumn. The bees work all the harder where the honey is taken. These should be well smoked in order to quiet them when these hives are opened, for on such occasions they are very ready with their stings. Superfluous wax should be cut out of the hives before winter comes, as it would harbour droues, the wax-moth, and other vermin; the hives should also be well fumigated.

Unfortunately bees, like human beings, are subject to sickness and famine, and when these fall on the hive, the bees change color, become emaciated, hang about the mouth of the hive, and, faint with cold and hunger, bring out their dead; an ominous hum is heard inside, and then it is full time for the owner to fumigate with the gum-resin, called galbanum, and introduce food in the shape of honey through reed pipes. It is not a bad plan to add a pinch of pounded galls. Dried rose-leaves, boiled wine, raisins, thyme, and strong-smelling centaury, are all good additions to the honey. Another capital plan for feeding the bees is to procure a basket-full of *Aster Amellus* root, boil them in good fruity wine, and then place them in front of the hives.

Bees, as a rule, are produced by spontaneous generation, people will be pleased to hear, but not invariably, as an old Cilician, a thrifty acquaintance, has bees which appear to produce their kind in the usual manner.

A shepherd, one Aristæus, had the honour of first illustrating the spontaneous theory. His

stock of bees having perished by famine and disease, caused him to complain to his mother, who was a kind of water fairy or mermaid. She introduced him to a cunning man, a sort of magician, passing by the name of Old Proteus; but he had many disguises; and this person in a very prolix fashion, and then only under compulsion, pointed out to the shepherd—who, by-the-by, showed far greater energy during the interview than he showed in the management of his hives—how he could produce a new stock from the dead bodies of cattle.—L. — *British Bee Journal*.

CANDIED HONEY.

If the honey turns to candy, it is a true sign that it is not adulterated. Watered honey will not candy. If a hollow is made in a lot of candied honey, the liquid portion will continue to drain out, until a hard mass remains on the outside core, which can ultimately be handled like sugar candy.

BEE FLOWERS.

All kinds of fruit trees, the sycamore, lime, berberis, lilac, raspberry, honeysuckle, beans, clovers, turnips, mustard, lucerne, mignonette, borage, mellilotus, cornflowers, sunflowers, buckwheat, *Limnanthes*, *Ambrosia Mexicana*, *Phlox*, *Whitlavia*, *Calliopsis*, and a hundred sorts of annuals, all culinary herbs, lupins, tares, most of the culinary vegetables are valuable plants for beekeepers.

SPURIOUS HONEY.

American Bee Journals have persistently contended no adulteration of honey is carried on among them. We in Australia know better. It is probable our cousins are too sharp to put it on the American market, and so send it to the gentle confiding Australians! We see now, however, from some of the American papers that efforts are being made to obtain federal legislation after the pattern of the Butterine law to prevent adulteration by levying a prohibitive tax on Spurious honey! There are some philanthropists amongst us who have imported this honest and thriving enterprise into Australia, as the Americans are not sufficiently enlightened to prefer that superior article *corn syrup and gum* to pure honey.

REMEDIES AND PALLIATIONS FOR STING.

A correspondent to the *British Bee Journal* of Dec 20 recommends a teaspoonful of powdered alum and a teaspoonful of powdered ammonia put into a 4-oz. ($\frac{1}{2}$ of a pint) bottle and filled with warm water, loosely corking only to allow the first evolution of the gas to escape. Applying some of this fluid immediately after being stung will it is stated relieve the pain and swelling at once.

Another writer advises a drop of diluted phenyl (that is a mixture of one part of pure carbolic acid and 5 parts water) to be placed on the parts stung and then rub it gently into the skin with a piece of alum.

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AUSTRALIAN

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JOURNAL

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J. H. KITCHEN.



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NOTICE.

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THE
Australian Beekeepers'
JOURNAL.

VOL. III.—No. 7.]

MAY, 1889.

[PRICE 6D.

Editorial.

HINTS FOR JUNE.

IF our advice for April and May has been followed, all stocks should now be in a position to be left to themselves for the next month or two, and supposing they are adequately supplied with food the less they are examined or disturbed the better. A careful beekeeper will have already seen that no queenless stocks are left to die out, and that any stocks showing signs of disease have either been properly treated or destroyed, or at all events marked as diseased; if the latter, they must be left till September, for breeding having all but ceased by this time, the disease will not increase in the hive until a higher temperature prevails and breeding commences again in Spring, and before this time arrives the stock must be dealt with as already recommended. Where feeding up the hives for Winter has been neglected it should be done at once, and for this time of year either honey from a source that can be relied on should be used, or, what perhaps is even better, blocks of feeding *Candy* made as directed in an article on "*Candy*" in the present number. From the beginning of June till September the principal points to be attended are to keep the hives dry and undisturbed, all stocks not having already 20 to 30 lbs. of food, to be supplied with it at once. Mats over frames renewed if worn out or dirty, and, if of enamel cloth, replaced by some soft and porous material, such as Hessian or Burlap, for enamel cloth covers in winter condense too much moisture in the brood chamber.

The matter of width of entrances for winter months is a somewhat disputed point, but we find the larger they are, so long as they are not too much exposed to direct cold winds the better. Entrances 3 inches wide by $\frac{3}{8}$ deep are as small as should be allowed, and if hives have entrances the full width of the front they should be reduced by small blocks of wood to about 3 or 4 inches wide.

In this month beekeepers should commence preparations for next season by cleaning and painting hives, preparing frames, melting all

scraps of comb down to wax, clearing up all frames of comb and storing them in a safe and dry place, for they will be worth money in the Spring honey flow. All partly filled sections should be either used up to feed lightly stored stocks or put carefully away with any empty ones on hand, so as to be ready to put into crates of new section boxes in October, for there is nothing will tempt the bees so quickly into the supers as two or three partly filled sections.

Advice to Beginners.—To those desirous of beginning beekeeping, we advise not commencing till the winter months are over. The end of August or during September will be quite early enough, for unless one can secure the assistance and advice of an experienced beekeeper it will almost surely happen that stocks of bees taken in hand by beginners now will be very weakly ones in the Spring. It is easiest to commence the undertaking in the early swarming season by securing good strong first or even second swarms; for, as a rule, these only leave the parent hives while there is a good honey flow on. If, however, a beginner can secure some stocks in winter, either gratuitously or very cheaply, let him do so. But attend to the following advice: If the hives are light, say, weighing less than 15 lbs., exclusive of the hives, the bees must be fed freely and regularly. The hives must be placed in a fairly sheltered place facing N. or N.E., and well protected from wet by covers of galvanized iron or boards, unless the hives are of the modern form with thoroughly weatherproof roofs. And last, but not least, any frequent examination or meddling, beyond what is absolutely necessary in case feeding is required, should be carefully avoided until warm Spring weather comes in.

THE HEDDON HIVE.

As many enquiries are made concerning this form of hive, and as our own experience has been limited to the working of two stocks only in the Heddon Hives, a correspondent has kindly obtained replies to a series of questions from an apiarist in the North-Eastern district, who has

been working with a considerable number of a form of Heddon Hive (made by the Beekeepers' Supply Company) during the past season. For the benefit of our readers we give questions and answers as they have been sent to us:—

How many Heddon Hives have you in use this season? 27.

Do you find much bridge comb built between the brood chamber? A little in some, others none at all.

Do you find that the queen readily occupies both brood chambers and travels from one to another, and keeps all parts filled with eggs? Does not readily occupy both, but when she does keeps them pretty well filled.

Do you think the centre post in the frame any hindrance to the queen moving over the comb, so as to prevent her keeping both sides filled with brood? A slight hindrance, for I have had one-half of the frames filled with brood, the other half with honey. If they were a little narrower I think would be no hindrance.

How many section boxes will the bees occupy and work well at one time? Two crates of sections after they are fairly started. Have tiered up to three crates of sections; but found it more advantageous to only work two, as I would get more properly filled that way.

Have you worked your hives with combs in line in the brood nest, over each other, or crossed the spaces of the bottom frames with the bottom bars of the top hive. Have worked them both ways, but have abandoned crossing the spaces as I consider it prevents the queen from going from one to the other.

(Signed)

J. WITHERS.

April 14, 1889.

Modern Bee Keeping.

A HANDBOOK FOR COTTAGERS.

The above is the title of a capital little book published for the *British Bee Keepers' Association*, and sold at 6d. per copy. As a very large number of beekeepers in Australia know but little of the modern methods of beekeeping or of the modern hives, and also as many are desirous of knowing, we propose to reproduce this little handbook in the pages of this journal for the benefit of this class of beekeepers, and also for beginners. We regret we cannot reproduce the little wood-

cuts which are in the handbook, and which, no doubt, would be of considerable aid to the reader. The descriptions and directions are, however, so clear and simple that the absence of the few illustrations will not be found a matter of great importance. The first part of the book is given below, and it will be continued in the following numbers of the Journal:—

I.—NATURAL HISTORY OF HONEY BEES.

A hive of bees consists of queen, workers, and, in the swarming season, of drones also. The queen is the *mother* bee, as she alone, except in very rare cases, lays all the eggs from which the inhabitants of the hive are produced. Her fertility is remarkable, as during spring and early summer she will often deposit from two to three thousand eggs daily for weeks in succession. The workers—so called because by them, amidst many other duties, the comb is built, the honey gathered, and the grubs fed—are barren females; but occasionally, when the hive has lost its queen, a worker will become so far fertile as to lay eggs, but these always produce drones. The drones are the males, and are produced at the approach of the swarming season, for mating with the young queens, and continuing the race. They gather no honey, and are driven from the hive by the workers when their services are no longer required.

Honey-comb consists of six-sided cells, and is made of wax, which is not gathered, but produced from honey in the body of the bee. Five of the smaller cells are together just one inch across, and in these honey and pollen are stored, and worker-bees produced. The larger cells, four to the inch, are the cradles for drones; while the queen-cells in which queens are raised, are not unlike acorns in shape, and hang with their mouth downwards, while other cells open sideways. The eggs, kept warm by the bees, produce tiny white grubs, which hatch out at the end of three days, and are fed upon a partially digested mixture of honey pollen, and water. The worker-grubs, in from five to six days, are fully grown, and are then covered in (sealed over) by a brownish cap of wax and pollen mixed. Twelve days more are required to convert the large white grub into a perfect bee, which, on the twenty-first day after the egg from which it came was laid, eats away the sealing which imprisoned it. Drones pass through like changes; but require twenty-five days to complete them. Sealed drones may be known by the size of the cells and the projection of the rounded sealed covers.

Bees can raise queens from any worker eggs, or grubs, if the latter are not more than three days old; the only apparent means being, forming a larger cell round the young grub and giving food in greater abundance. Although the queen is more fully developed than the worker, she arrives at maturity in five days less time; and it is well to remember that she hatches out eight days after being sealed in.

The length of a worker's life depends upon the labour it performs; during the hard work of summer it does not exceed two months, but bees

hatched in autumn, since they pass the winter in rest, survive well into the following spring.

The queen occasionally lives as long as five years; but usually is worn out in three. When the bees become aware that she is failing, they begin to take steps for securing a successor, and in due time the old queen is removed. Under healthy conditions, drones only exist in the spring and summer; but when a stock loses its queen, it permits its drones to live, and accepts those of other hives. The presence of drones at unnatural times is therefore a sign of loss of queen.

Those who desire a further acquaintance with the natural history of the bee would find the Diagrams, with their key, published by the Association, of great service and interest.

II.—STRAW HIVES OR SKEPS.

The movable comb-hive, hereafter described, offers so many advantages over those with fixed, or immovable combs, that the Association is labouring for its introduction amongst all classes of beekeepers, and, in consequence, a short description only of straw keps will here be given. These should be made of thicker material than cottagers usually employ, and should be flat-topped rather than dome-shaped, having a large hole in the centre of the crown, as this gives facilities both for feeding and supering, as explained in subsequent chapters, and arrangements should also be provided for enlargement or contraction of the entrance. Their size can hardly be stated, since, in fertile honey-producing districts, large skeps secure the best results, while, where the pasturage is poor, those of less size will be found more profitable; but cottagers generally use them too small. A suitable size would be 15 inches in diameter and 7 to 9 inches deep. The skep is both cheap and portable, and if made thick and kept dry it affords sufficient protection; but those who use skeps only must not hope to secure profits as large as those quite within the reach of the beekeeper intelligently managing frame hives.

It is very desirable that the floor-board be sound and flat. If at all larger than the bottom of the skep, the part projecting should be bevelled at the edges, while, if a straw hackle be placed over all, it will look neat, keep the hive dry, and do much to prevent the escape of heat.

Those who cannot readily obtain a practical knowledge of the use of bar-frame hives might do well to commence with the improved flat-topped skeps, from which sections of the best honey may be obtained; but it should only be as an initiatory step, and as the beekeeper becomes more skilful the bar-framed hive should be introduced and the skep gradually discarded. It must be remembered that the impossibility of enlarging and reducing the brood-nest at will is a permanent objection to the use of the skep, but improved methods of use are shown in later pages under the headings of "Quieting Bees," "Natural Swarming," "Driving," "Artificial Swarming," "Supers," "Feeding," "Feeders," "Uniting," &c.

III.—FRAME HIVES.

These hives differ from skeps in that the combs built by the bees within them can be, without injury, taken out and replaced at will by the beekeeper, and on this account they are often called "Movable Comb Hives." If a stocked skep be examined, the combs will be found to be built from the roof, each comb being about 1 in. in thickness with a space between it and its fellow of $\frac{1}{2}$ in. In the movable-comb hive, which may be compared to a box without a lid, frames are so placed as to be free of the sides and bottom. These frames are made $\frac{3}{8}$ th of an inch wide, while they have $\frac{5}{8}$ in. space between them, so making up the $1\frac{1}{2}$ in. and keeping the combs which the bees build in the frames in the same natural position with regard to one another as we find them in the skep.

It will be better, generally speaking, to get a modern hive as a pattern, before commencing to make frame-hives at home; while it is very desirable to determine, at first, the size of frame, and use that size only, as it is indispensable to a profitable management of frame-hives that all frames of comb should be interchangeable, so that we can remove a frame from any hive with a certainty of its fitting any other hive in use.

The British Beekeepers' Association has lately adopted a Standard frame, the dimensions of which are 14 inches by $8\frac{1}{2}$ inches outside measurement, the top bar being $\frac{3}{8}$ ths of an inch, the side bars $\frac{1}{4}$ of an inch, and bottom bar $\frac{1}{8}$ th of an inch thick, the form being rectangular.

Boxes can be bought very cheaply, which may be converted, by those who have a little mechanical skill, into really good hives. The wood should be stout. Lobster boxes, brandy cases, or Friedrichshall water cases, which may be purchased for a few pence, the last named of chemists, have been suggested as furnishing good material, and a fairly suitable form. The top and bottom of the box should be removed, and an independent floor-board made, which should project in front sufficiently far to form an alighting board at the entrance. If instead of buying boxes to convert into hives, we buy wood for making the outer case, we are free to choose the size the latter shall be.

The hive to take the Standard frame should be 9 inches deep; and if the wood, after planing, is not quite so wide, strips can be nailed on to make the hive the proper depth, otherwise the frames would nearly reach to the bottom board, and there would be a chance of crushing bees when the frames were replaced in the hive.

If we now make our hive $14\frac{1}{2}$ in. one way inside, it will give just room for hanging the frames, and as each one with the space intervening between it and the next occupies $1\frac{1}{2}$ inches, we may enlarge it the other way so as to take any number of frames, 15 inches being required for 10 frames, which is the usual number for stock-hive; and any space beyond may be otherwise employed, as hereafter shown. The 'Division Boards,' will enclose the frames, and back of the latter must be made $\frac{1}{2}$ in. lower than the sides, so that when the frames are in, the upper sides of the

top bars may stand level with the top of the sides of the hive. Two strips are put on so as to cover the spaces between the top bars, and give a level surface to the whole hive, upon which is placed what is termed a quilt, that is, a cover of unbleached calico, and three or four thicknesses of cloth or something of the kind, to keep in the bees, and prevent the escape of heat. The entrance-hole should be half an inch deep, and at least 6 in. long, and ought to be provided with some kind of door to reduce, when necessary, the size of the opening. For this purpose the door described under 'Robbing' will be found useful. A space of $\frac{1}{2}$ in. between the frame and the hive sides is required, and the bees will use this for passage way. If more space be left they will build comb in it; if less, they will glue the parts together with propolis, a resinous substance collected by the bees. When the cottager has not the facilities for making the standard frames accurately it would be better for him to purchase them ready made, as it is absolutely necessary that they all be exactly the same size, and perfectly rectangular.

(To be continued.)

Correspondence.

To the Editor of the Australian Bee-keepers' Journal.

Dear Sir,—In reply to your invitation in the Journal a month or two ago, asking Beekeepers to report, I herewith send you my experience since I began:—

I started Beekeeping November, 1887, by purchasing two full colonies of Ligurian bees in Langstroth hives, one of them having an imported queen. I had also a couple of colonies in boxes which I transferred to bar-frame hives and Italianised. I increased to eight before the end of the season. Having had three swarms from one of the Ligurians, and one from the other, all wintered well, and I had my first swarm on the 2nd October. I purchased four colonies in boxes from a neighbour about the end of October, and have now twenty-two full colonies, after selling four full colonies of pure Ligurians and one full colony, and six nuclei hybrid bees, also a pure queen. Have taken off this season about 900 sections and 400 lbs. extracted honey. The most I have taken from one hive was 135 sections, and about 60 lbs. of extracted honey, and from another 120 sections and 80 lbs. extracted. My honey crop would have been much larger, but a lot of my bees were not in proper trim when the redgums began to bloom, having been just hived. The redgums began to bloom about the end of November and continued till nearly the middle of January, but on account of the dry weather they did not yield so well as they otherwise would have done. There was then a cessation in the honey flow for a few weeks, and some of the bees commenced to swarm again. I put a few of them into new hives, the rest I put back to where they came from, after cutting out queen cells and giving them more

room, so as to have them strong for the next yield, viz.,—peppermint, which yielded well owing to the rains in January, and as most of my bees were ready I got more surplus from it than redgum. We have now a tree blooming what is termed here the bastard gum, and three or four of my colonies are filling sections now from it. I was rather surprised the other day when looking through my bees to find a few of the hives with brood in ten frames, which seems to me rather extraordinary at this time of the year; of course they are presided over by young queens.

Below I give you a rough statement showing my expenditure and income since I began, I took no surplus the first year beyond what we used ourselves, as we use about 28 lbs. per month.

Yours truly,

JAS. MCFARLANE.

St. John's Wood Apiary,
Lyndhurst, 29/4/89.

To Bees purchased at commencement	£7	0	0
„ Hives made up and painted. foundations, sections, honey and wax extractors, &c., &c. ...	23	10	0

£55 10 0

By Honey sold ...	£32	3	0
„ Bees sold ...	16	5	0
„ Honey on hand ...	7	12	0
„ 22 Colonies of bees in two-storey hives, valued at 40s. each*	44	0	0
„ Hives, extractors, &c., on hand ...	15	0	0

£115 0 0

It will be seen that leaving out the value of the bees, hives, and appliances, estimated at £59, the profits to begin with are a little in excess of expenditure, but counting stock the actual profit may be taken as £59 10s., or an interest of over 100 per cent. for my outlay. Added to this a season's experience (worth a good deal), and plenty of honey for the table in our house—no small item.

* The estimate of 40s. each for bees in two-storey frame hives, which at this time of year, cover 8 to 10 frames well supplied with winter stores is, we think, too low. We should say 60s.—ED.

Extracts.

THE HONEY BEE.—INSTINCT AND SENSE.

To make the subject clearly understood I will illustrate a few instances to show what I mean by instinct, what by sense. Under instinct those acts are understood which are innate with the birth of the individual animal or insect. Instinct induces the new-born infant to suckle; instinct induces the ducks to swim, the chickens to make use of their feet almost as soon as they have left

the shell of the egg ; instinct induces the bees to build those wonderful cells of wax, to make queen cells and gather honey, and many other acts which arise from inborn instinct and require no training, no experiments. Besides the inborn instinct we find the appropriated, the learned instinct. The child must appropriate the use of its feet. It requires a will to move one foot before the other at first ; but after a certain training no will is required ; the child walks about without engaging the will. To appropriate these acts the reflex nerves must be active in combination with the reflex organ until the latter becomes thoroughly acquainted with them (acts). If the reflex organ of the eye, for instance, could be removed the subject would see the objects as before, but it would not understand them—it would be senseless. Is the bee such a subject ? When a bee (or queen) leaves its home for the first time in its life it, immediately after taking to the wing, turns round with its head towards the place where it came from, and by describing small circles first and gradually enlarging them it impresses upon its mind the whereabouts of the entrance, the shape of the hive, bee-house and its surrounding objects. When it has become acquainted with these objects close by it extends its flights and soon knows the district in the distance of their usual flight, which extends over four miles. It has now deposited into its memory the shape, etc., of all objects remarkable in the surrounding district of its usual tour, and next time it leaves the home in an almost straight direction for the place where food is to be found ; it knows the locality. If it were now taken from its home to a distance of say two miles and let loose, it would soon find its right way for home. It would remember these big trees, or those small bushes, that house, etc., and thus the home must be in that direction. Is this not sense ? Why does it not fly straight away by its first flight as it does afterwards, in which case it could not find its home again, the entrance being so small and perhaps overshadowed by something ? Were a hive of bees removed to a new locality, then they would have to learn the principal surrounding objects again, and in the same manner as described when a young bee has its first flights. But the older bees have their memory better developed, and are stronger ; they soon know the locality, and return home laden with pollen and honey. Is this not sensible ? In winter the bees have a rest for several months, but they do not forget their place from the summer before during all this time, should they not be able to leave their home during the winter months.

The optical organ of the bee has the greatest function to perform ; otherwise they could not fulfil nature's design ; they could not distinguish the different colours and classes of flowers, and would go from one class to another. As it is, they do work only on one class of flowers during one trip. Here we find instinct with sense combined. Instinct guides them not to go from one class of flower to another, and sense guides them to distinguish the one from another—an orange blossom from a peach blossom, although both may stand close together and both may be in full blossom at the same time. In the meadow, where

so many different flowers open their nectaries almost side by side, the same proof is found. The bee takes only to the one class it has chosen then, and leaves all others unmolested, untouched. Without sense would it be possible to make this distinction ? And how gentle, with what dexterity, do they follow their occupation in search for pollen and nectar ! No sign of hostility or irritability is perceivable, they avoid offensive attacks, and sooner depart to a quieter spot. How different, then, is their behaviour in the field from that at their home ? Here they defend home and comrades to death if needed ; there they flee to avoid collision.

The queen is the principal of a colony of bees, and is recognised as such. If in warm weather a sufficient quantity of combs with ripe hatching brood and some honey were placed in a hive, but no bees and no queen with it, the bees when hatched would soon perceive that they were without a queen. They will run about looking for her, and if not found will start making queen cells if there is some young brood in their combs, in order to complete their home. These queen cells would be of the same shape as they usually are. Again, if a sufficient number of young just hatched bees with a queen were given into an empty hive without any comb and were well fed on honey, then these bees would soon start making comb to enable the queen to lay eggs. These newly built cells would be of the same size as worker cells always are. These facts prove that the bees know by natural instinct that a queen is required for their further existence ? they know how to form queen cells and how to build combs. But, on the other hand, if these queenless bees had not sufficient honey in stock, or if the weather was too cold, they would not rear queen cells. And if those young bees with a queen are not fed well enough to enable them to build comb, they will build none until they can gather honey enough themselves ; but they must be about ten days old before being able to do so.

If during a part of the season a hive of bees has gathered and stored a quantity of honey and was building new combs fast, but suddenly this supply was at an end, the bees would not use the stored honey for the continuance with comb building, but stop it at once. If the honey store were but small and the flowers would produce no honey for the bee to gather, as happens in bad seasons, would the bees increase breeding and build combs until the last drop of honey is consumed ? They would do no such thing ; they would decrease their brood, even in the height of the breeding season, build no combs, and destroy part of the brood even to save themselves from starvation for a while longer. All these and many other acts appear so natural, so instinctive ; but by close watching and study it must be admitted there is more than instinct shown and found in the home and life of the industrial insect, the honey-bee.

Besides these points referred to above I will now cite different actions of the bees in different seasons. It is a well-known fact that the bees store their honey above their broodnest if possible, and make the winter quarter where the broodnest was in the late summer ; they like to have

their stores above them and make use of it as required. As the weather becomes warmer in early spring, the bees get active, clean and polish a number of cells near their stores and in the centre of their clustre, and the queen deposits an egg in each cell. Then, any dead bees or other matter that may have gathered in the hive are carried out. As the weather gets warmer, the bees prepare more cells for brood, but never to such an extent as to cause the brood to get chilled, should cold weather follow. The unreasonable or unexperienced bee-keeper often causes chilled brood by placing empty comb between the brood, to make them breed faster, but the bees will repair such meddling by removing at least all young and unsealed brood (larvæ) before it is chilled, thus preventing the laying of the foundations of a destructive bee disease, and showing more sense than their "sensible" keeper. Now young bees begin to hatch, the number increasing day by day, and more brood can be reared and kept warm. The fresh honey gathered from the early flowers, too, induces them to enlarge their broodnest, as the time requires. By this time their instinct for natural increase (to swarm) awakes, to which end the drone-cells at hand are cleaned, and unfertilized eggs laid therein by the queen. Of these eggs drones arise, which are the male sex. Should no drone cells be in the hive, but room to build some, then that space is used for this purpose. The hive is now getting crowded with bees, and brood is in nearly every cell, in some is honey. They become aware that they and those that will hatch will not have room enough in their home together, so they start forming queen-cells, into which the queen lays her eggs, which, by the way, are of the same nature as those laid for bees in worker cells. From now the queen lays less eggs each day; she understands that to remain much longer in this hive is not safe to herself, as young queens will soon hatch: and after about eight days from laying the eggs for the young queens, she and about half the number of bees leave their old home to start and form a new colony. (We will leave them with the keeper in the hope he was watchful enough to have noticed their joyful music and parade in the garden, and will take good care of them). For the time being the parent hive is without a queen, but no such uneasiness is shown by the remaining occupants as is usual when they lose their queen accidentally. It is known to them that another majesty will soon hatch, which is the case within a few days or a week. But she must be impregnated by a drone before she can fulfil her duty as mother; and lo! we find that drones have been hatching for days past, and are flying about too eager to meet with a queen. In warm weather between 12 and 5 p.m., the queen will leave her home, and, in whatever direction she may fly, she is certain to meet with a drone if she chooses, and if successful connection took place, she is enabled to begin her designed duty and lay hundreds of thousands of eggs during her lifetime, which lasts about three years, and she has connection with a drone only once in her life; while her lover has to pay with his life his eagerness to do his duty. After the act is fulfilled he

drops dead on the spot. The drones have no other usefulness but to fertilise young queens, and if they have done that their design is accomplished. About two days after her successful marriage flight the queen commences to lay eggs, and soon almost all cells are full of brood again. But the season is far advanced. Therefore, from now they gradually decrease their brood and store honey in these cells to have it for the time of need.

Not every season is so favourable for the bees. In a bad season we find quite a different regulation. They do not rear brood to such an extent as to overcrowd the hive, and use the last drop of honey for it. They rear few or no drones; they have no desire to swarm, therefore no need of queen cells. Or, if the time was favourable shortly before swarming, but suddenly changes to bad, then they will give up swarming, destroy the queen cells, even the drones and drone brood, well knowing that under such circumstance the new colony, if formed, could not exist. Should Flora soon spend her nectar again, another attempt to swarm is most likely the result; but if it remains dull for a longer period, swarming is given up for that season. In a very good honey season the bees are not much inclined to swarm either, at least not the pure Italian bees, which are most desirous to store honey. The consequence is that soon the most cells are filled with honey, and not room enough is left for breeding to such an extent as to overcrowd the hive; no occasion for swarming arises. During the summer months there are from about 20,000 to 50,000 bees in one single hive. All know each other and their queen. Should a bee from one hive attempt to enter into another, perhaps with the object of robbing, etc., it would be recognised as an intruder, and be treated accordingly. Their entrance is guarded against strangers; they desire a quiet home, and they defend it, for which purpose nature has provided them with a poisonous weapon, the sting. Nevertheless, they allow themselves to be handled and be deprived of their surplus stores by the Bee-master, who knows their habits, has studied their nature, and treats them accordingly, without making use of their sting. Especially the beautifully yellow-banded Italians deserve the palm for their gentleness. Is there a more interesting study than the study of bees' life? Is any insect more profitable to its master than the bees? Is sense denied when in every particular of their life we find forethought, consideration, and reflection?

W. ABRAM, Manager.

Italian Bee Company, Parramatta.

INTRODUCTION OF QUEENS.

Those desirous of practising the direct introduction of queens may do so by the following methods:—Having repeatedly united colonies by alternating the combs of the respective hives without the use of peppermint or other scented

syrup sprinkled upon the bees to give them a common scent, I came to the conclusion that a queen parading unconcernedly upon her own comb and among her own bees could be inserted safely into any desired hive and such, after many trials, has proved to be the case. All who have given the method a fair and impartial trial have spoken very highly of it. In giving queens by this method, or when uniting bees in any way, the hives to be operated upon should first have the whole of their combs fully exposed to the light, and each seam of bees divided by drawing the frames so far apart that none hang from one to the other; and when the queen to be given is brought from another part of the apiary the comb on which she is with her attendant bees should always be carried in a box without a cover of any kind. Strict attention to this last particular is absolutely necessary, and the hints therein given are of far more importance than any amount of sprinkling with syrup, scented or otherwise. Of course it is understood that the bees are first smoked as in all manipulations.

Queens Received from a Distance:—Upon receipt of the queen go to the hive and remove the one to be superseded or otherwise. At dusk take the new queen, quite alone, after keeping her so for not less than thirty minutes previously, but quite warm, moreover without food meanwhile; lift the quilt at the corner, drive the bees back with very little smoke, and then permit the queen to run down; close the hive and make no examination until after forty-eight hours. Leave the operation until so late that a lamp is necessary. In this case the queen loses any scent she may have contracted on the journey. It matters not, as with the first method, whether the old queen has been only just removed or if the hive has been long queenless, and the new queen will always be accepted. When the queen is received at once make up a nucleus to receive her, thus:—From a strong colony take one frame of hatching brood with adhering bees and place in a nucleus hive, taking three Langstroth frames; then shake off most of the bees from another comb into such small hive, and on either side of the one containing brood place one comb of honey; close the entrance with perforated zinc, and place on top a sheet of straining cloth tacked to a simple frame. Thus securely confined, and having ample ventilation, they are to be taken into a warm dark room. In a few minutes, finding themselves confined and queenless, a great uproar will be heard; now slide the frame of strainer cloth just off one corner and let the queen run in, keeping back the bees with a little smoke if necessary. Close again and let them remain indoors until the third day, when stand out where desired. After a day or two give another frame of hatching brood, which repeat at intervals of seven days or as often as they appear able to cover more combs, until well established. In this case the bees are reduced to exactly the same condition as the recently-confined queen.—*South Australian Chronicle*.

FERTILIZATION OF FLOWERS.

In the absence of bees the fertilization of flowers by hand has been tried at Mildura with great success, particularly with plants of the gourd tribe. Mr. C. Peach, of Deakin Avenue, noticed that his pumpkins were not forming, although the foliage and flowers were all that could be desired. He accordingly took the anther from a male flower and touched the female flowers with it and the result was the immediate formation of the "fruit." This method of fertilizing has been adapted by Mr. G. W. Knight, of Sandhurst, with great success in his experiments with vines, and the recent development of a magnificent grape by treating the Waltham Cross in this manner is reported.—*Mildura Cultivator*.

DIVIDING BEE SWARMS.

(By "STING" IN THE QUEENSLANDER.)

It is still a disputed point whether it is best to allow natural swarming, or to practice "artificial swarming," or, as it is better called, dividing. Like many other points in beekeeping, where there is so much variety in methods of managing an apiary, it will doubtless remain disputed. What is best for each beekeeper is what suits him best. When simple increase in the number of colonies is the object, to divide is, of course, the only plan open, unless one risks the uncertainty of the bees swarming or not. To be truly successful, however, it must be done with great care. When a colony of bees is suddenly deprived of their queen, after the first hubbub caused by her loss is over, they proceed to supply her place. But they do not take time to rear the new queen from the egg as they do in natural swarming. They may take any larva or bee-grub that is unsealed. They may select one already six days old, enlarge its cell, try to cram it with queen-jelly, and trust it will come out all right, a queen. So it will, but a very poor one; for it has lost three days at the most important period of its short larval life, during all of which it should have been nursed as an intended queen-mother. And since these half-developed queens hatch first, and the first hatched is usually selected to be the mother, it is ten chances to one that in the queenless half of the divided colony there will be ere long a worthless queen. This danger can be avoided by having either ripe queen cells, virgin or fertilised queens ready to place in the queenless half. But this entails an amount of time and care and work greater than hiving natural swarms. Dividing colonies does not, besides, entirely prevent the danger of a swarm with a virgin queen leaving that part of the hive which contains the brood. If the hive has been very populous, and there is a great deal of brood hatching daily, such a swarm is quite liable to appear. If so, it may be returned after all the cells in the hives have been cut out, or the young queens already hatched, caught, and killed. But what a labor this is! and who cares to put up

with all the fickle tantrums of a virgin queen in a swarm? More than that, the old queen may still swarm when she has filled her new hive; and it is a question whether colonies so divided work with the *vim* of a newly-hived natural swarm.

Apart from securing increase, I believe that the beekeeper whose whole business is in his apiary, or who can provide a watcher competent to hive the swarms, is best paid by allowing the bees to follow their own way.

If a beekeeper, however, must leave home, and he has no one who is able to look out for the swarm that may be expected from, say a single hive, then he should divide by all means. First, find the old queen. This is a matter of some real difficulty, especially when the bees are black, or hybrids, and the operator is not accustomed to the search. The great secret is to open the hive as quietly as possible, with the least possible smoke, so as on no account to set the bees running, or to frighten the queen herself.

Now, with the queen safe on the comb on which she has been found, in another hive or box, covered with a piece of mosquito net, in case she might fly, remove the old hive to the stand it is to occupy. If that is near its old stand, as it usually will be, turn the entrance to one side at an angle of 45 deg. for a day or two, or some of the flying bees may return to it. Next prepare the new home for the queen on the old stand. It should be a hive as like the old one as possible; especially in colour.

When it is in position, and the flying bees now returning to it in numbers (as you have chosen a day when the bees are busy gathering), place the comb with the queen on it in the centre. If the old hive is very crowded, take another well-capped brood frame from it and place it alongside the one already in the new hive. Fill up the latter with frames of foundation or empty comb. Foundation is best, because the bees will not have empty comb in the brood nest to fill with honey, and the queen will occupy the cells as they are pulled out. If you have neither, put in three more combs with starters, one *between* the two brood combs, and fill up with wooden dummies instead of more frames. This is to prevent the bees filling the frames with drone comb, which would be the case with three or four of them if the new hive were made up with starters only. In less than a week, probably, the three new frames will be filled with straight worker comb and eggs in nearly every cell. Then put two more frames with starters in the middle of the brood-nest; but, as before, with a brood comb between them.

When the frames, or frames and dummies, are arranged in the new hive with the queen, take a new super of extracted frames, or of sections, and place it on the new hive. If you have contracted the brood nest with dummies or filled up with frames of foundation only, and you wish to put on a super of extracted frames, first put a queen-excluding honey board of some sort between them, or the queen will lay in the super at once, and you will have the super with frames mostly honey and a little brood, and frames below deserted. With sections there is not so much danger, especially if separators are used. With

the empty super in position, place the super that was on the old hive, or, if you had two on the old hive, the better filled, on the top of the empty one on the new hive, with all the bees it contains. Now shut up the new hive; but we are not quite done with it. It will be better with some of the young bees from the old hive, so shake the bees off two or three of the brood frames on its alighting-board, and return the frames to the old hive.

The division is now completed, and we return to the old hive. Draw the remaining frames in the brood nest to the centre, and you find a frame wanting on each side. These you may replace with frames of empty comb, frames of foundation, or dummies. There is no use putting in frames with starters only, for the bees will only fill them with drone comb; unless you wish to have two frames of honey to be cut out for home use in the winter. If so, put a frame with starter only on each side of the brood nest, and you will have two frames full of real, ripe, delicious honey by then, though the comb may be a little darkened by the bees' feet. Put a new super, or the less filled of the two you had before, on top, and close the hive.

Now for the young queen. If you have found, in looking for the old one, that the bees are well on with queen cells, in preparation to swarm, you are in luck. You have combined the benefits of dividing with the advantages of a natural swarm. The queens that hatch will have been reared from the egg. But should you not have been so fortunate, go to the old hive on the *eighth* or *ninth* day after dividing, not later, and look over the brood frames. You will find queen cells, most capped, some uncapped; attend to the capped ones. Bees always cover the queen cells they set most store by with a rough coating of wax and propolis. This coating is rough because pitted with little hexagonal hollows, like miniature comb, and the more the workers think of the young queen in the cell the larger the cell is the rougher they coat it. Therefore choose two or three of the very largest and roughest, and ruthlessly destroy every other queen cell. To do this it is only necessary to tear them with the point of a pen-knife or a bit of stick. In a week or ten days after this the young queen will have probably mated and begun to lay.

THE DELUGE OF SHAM HONEY.

It is no wonder that storekeepers can be persuaded to undertake the sale of "American" glucose, which really has been made up by colonial adventurers in such neat and attractive packages and labelled as "pure garden honey," with a piece of real honeycomb inserted in the glass jar to make people believe that the syrup within was gathered from the choicest flowers of the garden by the honey bee. The syrup is clear and bright in appearance, the glass jar can be placed upon the table, and the label is quite a pleasant picture to look at. The price of the imitation is low enough to leave a margin of profit for the grocer, and for a time the purchasers continue to take the stuff off his hands

because it is neat, handy and clean; but after a time it is found that people do not like "pure garden honey" of this kind. It possesses something of the flavour and appearance of honey, but does not create a desire for a continuance of the treat after the first two or three experiences. It is not like honey in that respect, because honey never palls the palate when used in moderation, whilst the glucose imitation creates a surfeit within a very short time. "But why not make up the real honey in equally attractive and handy form?" says one who knows nothing about the difficulties. First then, there is the fact that the glucose syrup can be made at almost a nominal cost; then the attractive, brilliant, artistic labels are not easy procurable, and the glass jars are so very high in price here. Perhaps, if imported direct, as is done by the "glucose honey" makers, they might be got for about 1½d. each; but the beekeeper can only buy them through middlemen by the dozen or gross, and then the price is a 1½d. to 5d. each for jars holding 1lb. of honey. Then the jar must usually go through the hands of the grocer, who fairly asks 1d. to 2d. per lb. profit making the cost of the honey 6d. to 7d. per lb. before the beekeeper gets a chance for his own profits. If he sells honey in kerosene cans of 60lb. each he expects 3d. to 4d. per lb. for it; and if he puts it up in glass jars with expensive labels he ought at least to get 4d. per lb., which would make the price to the consumer 9d. to 10d. per lb., which is too high to make honey a popular article of diet. We require thin, light, well-made clear jars that will hold from 1 to 3 or 4lb. of extracted honey, such jars not to cost more than 1½d. to 4d. each. Very few people would mind paying 2s. for a 4-lb. jar of honey, because the glass jars would always be handy in the house after the honey was used. If we can put the honey up in as attractive a form as is the case with "glucose honey" the grocers would be glad to take it up, and there would soon be such a demand for it that our beekeepers would not have any difficulty in getting quit of all they can produce.

Now we come to the root of the matter. To fight the glucose imitation, to beat the imitators, and to place honey upon a proper base, it is necessary to work upon a large scale. We must be in a position to purchase jars, labels, cases, and packing materials upon a large scale so as to secure the lowest rates; we must be able to pack up by scores of tons in place of scores of pounds. It will be hardly possible, except in a few isolated cases, for single apiarists to do this; therefore they must adopt co-operation, just as is done with dairymen and others. All honey should be sent into one common centre, and there it would be graded up, packed, labeled and distributed through the breadth of the land. If any apiary should be too far away from this centre it could be arranged to send out the necessary material for packing, or also even a person skilled in the work, and the apiarist could make his own arrangements for the disposal of the honey at the nearest villages. Being a member of the co-operation he would obtain his labels, jars, &c., at company's prices. Those apiarists residing within a reasonable distance from the centre would send in all their extracted honey in tins or other suitable vessels. At the central

store it would be received by the agent, who would grade it and credit the sender with its proper weight and grade. The honey would then be packed up and disposed of to the best advantage, and after deducting the costs and charges the balance would be paid over to the consignor.

Much the same plan is now in operation except as to packing and labelling (the absence of which is the occasion of very serious losses to the beekeepers). Country apiarists send their honey into Adelaide in old kerosene-tins, or sometimes in tins of the same size and form made for the purpose, each containing about 64lb. Sometimes it is sent in barrels or even boxes, but in such cases the honey runs through the crevices and will hardly be received by carriers or storemen. Anyway, the packages are too bulky for retailers, and are often so dirty that they are dubious about the character of any parcel. The result is that honey so packed must be sold "with all faults," for which a liberal margin is often provided, and it often happens that 1½d. or 2d. per lb. is paid for honey that should sell wholesale at 3d. to 5d. per lb.

There are agencies in the city who deal with honey sent in to them, and it would be possible, perhaps, to induce these people to undertake the packing and labelling, as well as the disposal of the produce; in fact, we are certain that this could be arranged, but it would be necessary that a good number of beekeepers should guarantee to send in their produce regularly to their agents. They would have to set apart a store, to provide tins, jars, labels, cases, and servants to deal with the honey; and it would not pay to provide all this without a certainty of employment.—*Adelaide Observer.*

NECTAR.

Very few bee-keepers will require to be told what nectar is—a sweet, sap-like exudation found in various parts of plant, principally near the bases of flower petals, highly flavoured, and medicinally charged with the active principle of the plant which secretes it; this nectar being very rich in cane sugar, which is changed by the bees into grape sugar, such a change being absolutely necessary before cane sugar can be used in either bee or animal economy as heat-producing food, assimilation being otherwise impossible. This is all very well, but it only goes part of the way. Nectar is more than all this, for it varies as much probably, as do the drugs on the shelves of the chemist's shop; it is health-giving or poisonous, agreeable or positively distasteful, according to its plant source; and it is only by the accidental mixing by the bees, when the source of income is various, that we are so seldom brought into contact in this country with its deleterious or distasteful properties. When we get unmixt nectar, unmixt honey, we run a risk of finding odd individuals who are unable to partake of such honey without unpleasant consequences, but in the other and great majority of instances the same honey is not only a delicious sweet, a wholesome food, but a positively beneficial diet from a medical point of view.

Having thus rapidly sketched the varying conditions of nectar from the moment of its seizure by the bee from its tiny resting-place upon the plant to its use by us as food, let us try to conduct our readers through what we consider the alphabet of its growth, the spelling of its mysterious constitutions, for the marvels of the chemistry applied in its cell laboratory we perhaps shall never attain to. In order to understand all action, a rough and crude outline of a portion of structural botany may be here necessary. All plants consist of a number of cells of various shapes (more commonly circular or egg-shaped), and it is by the growth, subdivision, and multiplication of these cells that the structure of the plant is increased. The cells reach from the naked white cells at the extremities of roots to the cells at the terminal points of the growing bud, including the cells filled with coloured sap on the flower petals, and others found in fruits or seeds, each cell doing its work in wonderful sequence and order. A growing nucleus, moving in protoplasm, surrounded by fluids, and confined by a skin, is the normal condition of such cells as we are dealing with in this article, therefore, to illustrate the circulation of the sap we ultimately meet as nectar. We will proceed to describe what is termed 'osmose' (the mixing of substance through a dividing film or partition). Suppose we fill a common bladder with honey, tying in the bladder neck a glass tube, and plunge the whole into a vessel of water. The different densities of the two substances divided by the permeable wall will gradually be adjusted, but for a long time the water will pass into the bladder, causing a rise in the tube. This is endosmose, and is similar to the action of the root cells, which absorb water out of the earth; the water mingles with the denser cell contents, and the denser cells adjoining act in a similar way to each other, passing the sap upwards, and thus starting circulation of sap. It is thus, by imbibition of water, that we get tension of the cell membrane, resulting in various modifications of cell and vessel formation in various parts of the plant.

There is, however, another action performed by the film of our bladder, which we will now suppose to contain a stained substance (of different density to the surrounding water). Not only will the water be passed in by endosmose, but a portion of the bladder contents will pass outwards by exosmose. The sap passes upwards by the central parts of the plant until every growing part is bathed by it as completely as our own flesh cells are momentarily supplied by the circulatory system of the blood. The green colour contained in the leaves and many stems of all plants is chlorophyll, a chemical substance which can only be secreted by the cells in the presence of iron and light. Openings between cells (stomata) permit the passage of the atmosphere amongst the cells, and as the atmosphere contains a varying percentage of carbonic acid (carbon dioxide CO_2), a peculiar action takes place immediately this gas comes into contact with the grains of chlorophyll moving about in the cell-sap, i.e., the carbon is

seized and split from the carbon dioxide, the oxygen is set free, to again refreshen the air. The carbon particle grows gradually into starch grains by additional secretion, but as these are insoluble in water alone, they remain fast prisoners in the cell, waiting to be acted upon in another way (be it remembered that the movement of water holding various substances, mineral and otherwise, is a constant necessity of life and growth) by metastasis; that is, certain chemical constituents of the sap (mineral, alkaline, or acid substances held in solution along with alkaloids and other active principles), amongst other wonderful properties, possess one of converting starch into sugar. It is thus dissolved and carried about into various parts by the exosmotic action already described, to growing points particularly, and by consequence to the flowers. We have thus a perfumed nectar in the sap of a comparatively stiff, slug-like consistency and movement, by reason of its distance from its water supply and the amount of water lost by evaporation through the stomata (cell-mouth).

If we cut in two, sharply, the stem of a juicy plant, we rupture the cells, when, the extremes being relieved, the unimprisoned sap is observable, and this is in greater quantity nearer the centre of the plant. On the other hand, if we cut a strip of bark off the round of a young tree, we shall notice the flow of sap greater on the upper portion of the remaining bark than on that below. We deduce from this that the circulation of the sap is (crude, weak, and fluid) up the centre, but down the outermost parts of the plant, perfected and rich in preparations ready to be stored in fruits (seeds), tubers, &c., and for the formation of new wood. There is, then, an outward movement of perfumed sap, rich in sugar, and this must necessarily pass into and through the arrangements of superficial cells known as nectaries. Linnaeus erroneously called every gland-like structure a nectary, if it seemed not to be an integral part of the general organs of the flower, and De Candolle* throws much light on the whole subject when he informs us 'that in regular flowers the nectaries may be found placed in a symmetrical manner;' and, not finding this the case in irregular flowers, he pertinently asks, 'Is it the presence of these irregularly placed nectaries which causes the irregularity of the flower, or is it the irregularity of the flower which causes that of the nectaries?' In our opinion he slowly but surely advances to a solution of the question, observing 'that when one sexual organ is aborted, its place is taken by a nectariferous gland. . . . The nectaries upon the inner surface of the corolla are always superficial, and they often cause a cavity there;' so that if, as in the case, the outer surface cells of the nectaries of flowers are rich in saccharine matters, any denser than innermost sap cells, the cell shape becomes contorted, having as a place for growth, only the surface previously occupied by atrophied floral organs. To make ourselves plain, if the stamens or petals of certain flowers disappear, their place being occu-

* *Vegetable Organography.*

pied by a nectar cavity, there will be a tendency towards distortion of the cell walls, extreme tension produces rupture, and we thus by one means get exposed nectar. Irritation by the tongue and maxillæ of insects is doubtless another method of getting at the same result when we remember that the sap in the cells is at such a tension that the imbibition of water by them splits the wood of the surrounding stem. A further cause of the exudation of nectar is that 'the constant chemical changes going on in the interior of the plant give rise to electrical conditions,'† and when this is accompanied by various electrical changes in the surrounding atmosphere, we can easily conjecture the rupture of myriads of torsioned cells, and the well-known resultant honey-glut; especially is this the case when the air is humid, the reason being apparent on the surface. This humidity of the air brings us to what we consider the ordinary mode of procedure by the plant in the production of nectar, a condensation of aqueous vapours by the plant-cells of the flower (and these are always colder than the surrounding air, except in case of nipping by frost), results in droplets of dew, which run and fuse together, like condensed steam on a window pane; this collects in certain depressions called nectaries, when the osmotic action previously alluded to takes place, producing actual rupture of the cell, the contents of which mingle with the condensing moisture, giving us the true nectar, the veritable honey-dew. The waving, irritating motion given by the wind, the rapid variations of the surrounding moisture indicated by the barometer, a sudden rise in temperature, are all conditions accompanying electrical disturbances, and therefore are accompanying conditions to nectar secretion, or rather to nectar expulsion.—*British Bee Journal*.

BEE CANDY AND HOW TO MAKE IT.

1. Use preferably a brass jelly or preserving pan, otherwise an enamelled tin or plain iron one. 2. Put in 10 lbs. white granulated sugar, at 2d. or 2½d. per lb., 2 pints (imperial) of cold water, and half a tea spoonful of cream of tartar. 3. Set on or hang over a brisk fire, and stir gently now and then until the sugar is all melted. This should require about fifteen minutes. 4. Almost immediately afterwards the whole will reach the boiling point, at first throwing up a deal of froth. The fire may be moderated or the pan withdrawn a little at this stage, when the foaming boil will settle down to a clear crackling one. This boiling should only occupy about two minutes. 5. Now try a drop—let fall on a cold surface, withdrawing the pan from the fire in the meantime. If the drop at once begins to set, so that in a few seconds it will draw out as a thread when touched with the finger, the mass is cooked enough. If not, boil a few seconds longer and try again. 6. Remove the pan from the fire and set it in a trough of cold water. It may be

left there for a few minutes while the moulds (flat or soup plates will do) are being set ready, each with a thin sheet of paper, rather larger than the mould laid in. Returning to the pan, commence and continue to stir briskly until the mass begins first to get dim in colour from incipient granulation, and then to thicken to the consistency of thin porridge. Then pour into the moulds, warming any remainder slightly to get it to leave the pan. This cooling and stirring process should take about fifteen minutes more. 7. Thus in about thirty-two minutes we finish the whole process, with the result that we have 12 lbs. candy from 10 lbs. sugar. The cakes should set within an hour so as to be safely turned out of the moulds. When quite cold, they should still be soft enough to be easily scratched into with finger-nail, and to melt in the mouth with a soft grain. 8. Invert them over the cluster of bees, with the paper left on, and cover up warmly. This may be done while they are still somewhat warm.—W.R.—*British Bee Journal*.

INCREASE, OTHERWISE THAN BY NATURAL SWARMING.

FRIEND DOOLITTLE TELLS US HOW TO MANAGE IT

A subscriber for *Gleanings* says he cannot stay at home and care for the swarms which may issue from the 30 colonies of bees which he has, and wishes me to tell him how he can manage next season so as to increase his bees and still have them do good work in making comb honey. After trying nearly every plan of artificial increase which has ever been given, I am satisfied that none of them will give as good results as will natural swarming; but where one is situated as is the writer of the above, of course a substitute for the good old way will have to be resorted to. Knowing that there were times when increase other than natural swarming would be very desirable, I kept a record of all my experiments while trying the various plans of making swarms, as given at different times to the public, and, according to my views, the two following come the nearest to nature's way of any now before the world. The first is a plan which was adopted by Elisha Gallup, and given to the world some twenty or more years ago, while the latter plan is made up out of different hints I picked up here and there. The Gallup plan I have practiced quite extensively for years, while the other I use almost altogether at the present time. All the particular difference there is in the two plans is that, with the latter, a new queen is given to the swarm, leaving the old one to continue to do duty in the old hive; while with the former the old queen goes with the swarm the same as she does in natural swarming, thus leaving the bees to rear a queen of their own. By giving each part a laying queen, great gain is made; still the Gallup plan is a good one where one cannot rear the queens before he makes the swarms or feels too poor to buy them. None of

† McNab.

the plans of artificial increase should be used until the hive is quite well filled with bees, and the bees themselves are preparing for swarming. When the proper time has arrived, go to any colony from which you wish to take a swarm, and, after having removed the cover and quilt or honey-board, drive the bees out of the way with a little smoke so that you can shave the capping off from some of the sealed honey at the tops of the frames. unless you think they have plenty of unsealed honey in the hive. Just previous to doing this, you should find the queen, and cage her on one of the combs with one of the wire-cloth cages which will push into the comb, as has been so often described. Having both of the above done, close the hive and beat on it with the fist, at the same time blowing smoke in at the entrance, just enough to frighten back the guards as they come out to drive off the intruder. Having the guards all turned back, give the hive several sharp blows, enough to cause the bees to thoroughly fill themselves with honey; and if more than one swarm is to be made, go to the next hive and prepare them in the same way, while the first are filling themselves; otherwise you will have to wait till the bees have their sacs full. When this is accomplished, set the cap of any hive on a wide board a little way off from the old hive (any box will do), and proceed to shake the bees off the frames till you think you have about three-fourths of them, shaking them in front of the cap or box on the wide board, into which they will run as fast as they are shaken off, if the same is raised up a beespace on the side next where they are shaken. Lastly, take the frame having the queen on it, and, after uncaging her, shake her and the bees off this frame, letting them run in with the others. Now close the hive, when the returning bees from the field and what were left on the combs and about the hive will make the colony in about the same condition it would have been in had it cast a swarm. Next take the cover having the bees in it; carry it to the shade of some tree, and, after setting it down, lean it up against the tree with the open side out, exposed to the light. Leave them thus while you are making other swarms, or for about an hour, when they will conclude they are a separate colony, and will behave just like a natural swarm, having clustered in the box the same as a swarm does on a limb. Now hive them as you would a natural swarm, and they will work the same, or as nearly so as is possible to have bees do outside of natural swarming.

The next way, and the one which I prefer when I have laying queens to spare, is to proceed the same as above till you get ready to shake off the bees, when they are to be shaken into a box instead of in front of a cap. This box is to be made of a size to hold about half a bushel, the two sides of which are to be of wire cloth, one permanently nailed on, and the other is to have the wire cloth nailed to four small strips, so that four small nails, one through the centre of each strip, will hold it fast to the box, yet make it readily removable when we wish to get the bees out. In the top of the box is to be bored a hole of the right size to admit the small end of a large funnel, such as is used in putting up bees by the pound, and over this hole

is to be fixed a slide so that it can be closed as soon as the bees are in. Having the box and funnel, proceed to shake the same amount of bees down through it into the box as you did in the former case; but instead of putting the queen with the bees in the box, uncage her and set the frame having her on back in the hive. In this case you leave the old colony in the same conditions in which they would have been had they cast a swarm, with the exception that they have the old queen with them, so as to keep up egg-laying all the while. Now carry your box of bees to your bee-cellar, or some other cool dark place, and leave them undisturbed for four hours, when you are to go and get a queen in a round wire-cloth cage, from one of your nuclei, or one which you have bought; and after getting where the box of bees is, jar the bees to the bottom of the box, by setting it on the floor suddenly, so that they will not be running out while you are putting in the queen, and immediately let your queen run through the hole into the box. Now close the hole and leave the bees till sunset or the next morning, when you will find them clustered and ready for hiving, the same as a natural swarm would be, having accepted the queen which you gave them, as their own mother. Hive as before, and the work is done.

In using this latter plan it is best to take the bees between the hours of 10 and 12 a.m. In writing this out it seems like a good deal of work; but where making many swarms, the work goes on rapidly, as the bees are filling themselves while you are working, so that there is no waiting. In this way swarms can be made about as fast as natural swarms could be cared for, while they work nearly as well after they are made.

G. M. DOOLITTLE.

Borodino, N. Y., Jan. 17, 1889.

COMB FOUNDATION.

Comb foundation is made of several forms—that is, with different impressions of the cell base. Some are exactly like the natural comb, and is called “natural base;” others are made with the cell base flat, and are called *flat-bottomed foundation*. It is also made of different thicknesses. Some will run about five square feet to the pound, and is known as thick foundation. This is the kind used in the frames of the brood nest. Thin foundation generally runs about seven feet to the pound, or even more, and is used almost exclusively for starters in section boxes. Both thick and thin foundation is made with cells of drone size, as well as worker size. The thin drone-sized foundation is always used for section boxes, and the thick for super frames for extracting; or for a frame or two in the brood nest when it is desired that a lot of drones shall be reared.

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[PRICE 6D.

Editorial.

HINTS FOR JULY.

This month, in the Southern parts of Australia, is generally the coldest, and the one, therefore, in which bees are nearer hybernation than at any other part of the year; they are, in fact, having their true winter rest. This being the case, bees should seldom be disturbed in July, except upon the greatest emergency, such as lack of food and threatened starvation; such a contingency, however, will seldom occur with the careful beekeeper, for, during May at latest, he will have seen that every one of his stocks has been provided with ample stores for the winter, for feeding in July, in the colder parts of Australia, must be carefully managed to be successful. In the warmer and sub-tropical districts, bees gather honey even in July and August, and often commence breeding before the latter month is over. If hives are kept on the ground, care must be taken to remove any growth of weeds or grass from round about the bottom boards, and also that bottom boards are free from damp, or trouble will come with spring-time. American beekeepers advocate placing hives on the ground, and a good many in Australia do the same, chiefly, we believe, because it is cheaper than placing them on stands, and partly because of a belief that an alighting board resting on the ground enables many a tired and fallen bee to creep into the hive. For our part, we prefer our hives some inches at least above the ground; first, because the bottom boards are kept dry; second, because the bees are kept free from the annoyance of ants and other insects; and, 3rd, because it seems more in accordance with the natural habit of the bee not to take up its domicile near the ground. We have many a time watched heavily-laden and tired bees fall short of the entrance of hives placed on the ground, but have seldom seen any crawl in unless they have fallen on the alighting board itself; but, after resting, they nearly always rise again on the wing and fly for the entrance. We do not think, therefore, that any more bees are lost if the hive is 20 feet

above than if it were on the ground. The best height, we consider, is that which gives the greatest facility for manipulating the frames in a standing position, say with bottom board from 8 to 16 inches above the ground.

With July comes the necessity of looking out for the coming season's requirements, and hives and frames got ready—old ones cleaned and re-painted, feeders prepared for spring feeding, frames and combs put away for the spring, examined to see they are free from marauders or mildew; there will be no fear of the latter if they have been kept in a well-ventilated place. We have found it a good plan to wrap both frames of comb and unfinished sections neatly in clean newspaper, and putting them away on a dry shelf in a well-ventilated room, unless mice are about, for if these marauders once taste the comb they will soon spoil the whole stock. Hives that are kept in the open without a shed should be examined externally from time to time during the winter months, to see that the roofs are water and weather tight, and any defects in this direction should be at once remedied.

COMB FOUNDATION.

On page 110, of No. 7, we gave a brief note on comb foundation, and as we have received a good many questions about kinds, qualities, and colour of this material, as well as concerning best methods of fixing it to frames or in section boxes, cutting to size, &c., we propose to go thoroughly into the subject for the benefit of our querists and such others of our readers who are not fully acquainted with the subject.

Comb foundation is made from pure beeswax, either by pressure between plates or by rolling between embossed rollers, and many beekeepers now make their own foundation. The roller method is the one chiefly used in Australia. The wax is melted over water in a deep vessel, and thin boards first soaked in water are dipped into the melted wax once or twice or even three times, according to the thickness of the sheet required. When cool a sheet comes off each

side of the dipping board. These sheets are passed through the rolling mill, after which they are trimmed to the regular sizes and packed in boxes. Some skill is required and especially in management of the wax.

Makers of the various kinds of comb foundation extol their particular article, and often claim that bees will take to it and draw it out into cells quicker than any other: but, according to our experience, more depends on the quality of the wax used and the general cleanness of the material rather than upon the exact form.

It is generally supposed that the completed cells in a finished comb contain no more wax than existed in the foundation: and that, in section boxes where it is desirable to have the minimum amount of wax and the cells as thin as possible, the desired end is accomplished by using very thin foundation. For brood chambers or super frames for extracting, thick foundation is always used, and should never be thinner than 5 feet to the pound.

In judging of comb foundation the first thing to notice is the character of the wax used, the appearance, colour, smell, and so forth. It should look fresh, clean, and have a fresh, sweet odour. Foundation that has been made a long time loses much of its fresh odour, but if otherwise good will be nearly as readily accepted by the bees as if freshly made.

The wax should be tough and not easily broken by bending, unless in very cold weather. If warmed to about 65° Fahr. it should bend nearly double without fracture; if it be brittle it shows the wax has been overheated, and will not be liked by the bees.

The impressions should be sharp, and a good wall of wax be seen around each cell, giving enough material out of which the bees can draw out the cell walls to the required height. A good deal of amateur made foundation has not a full impression, either through bad setting of machine rollers, or using sheets east too thin.

Foundation is generally sold by the pound weight, cut into sheets the size of the Langstroth or Australian standard frame, or in narrow sheets the same length, but only half the width. It is usually cheaper to buy a large package of 10 or 20 pound, than by the single pound. As regards the colour of the wax used, it appears to make no difference, so long as it is clean and sweet, well impressed, and not too brittle. The cost of foundation prevents many from using it, but if one is keeping bees for profit it pays well to use it, for instead of keeping at home and elustering for the formation of wax, a process requiring the presence of a large part of a colony, the bees will be out gathering honey, which will pay over and over for cost of foundation. Some apiarists, studying economy as they imagine, are satisfied with using *guides* or *starters* in the frames, instead of full sheets. These may be as narrow as a quarter of an inch, or up to two inches, and serve as a guide for the bees to build combs parallel with and in the frames. For this purpose they do well enough, but we think it poor economy where honey produce is desired.

Now about fixing foundations in frames. Frames are often made with a groove down the centre of the under surface of the top bar in which to insert the edge of the foundation, while some are made to be wired, and have no groove; and, again, there are many devices for fixing foundation in frames which have been tried and abandoned for the methods we shall now describe. Let it be first understood that we recommend that frames should always be wired where full sheets of foundation are used. Where guides or starters only are used, the foundation should be cut in strips the desired width by means of a straight edge and a sharp knife, and if the weather be cold this should be done in a warm room, or the foundation itself should be slightly warmed, and it will be found to cut more easily if the knife be frequently dipped in hot water to both wet and warm it. Some melted wax will be required, and it should always be melted like glue over hot water; indeed a small glue pot makes a very good melter. If wax is melted in a vessel directly over the fire it is likely to burn and spoil. Take a frame and carefully insert one of the strips of foundation in the groove. The strip should be shorter than the frame by nearly half an inch, so as to not quite touch the side bars. If the groove is a little narrow for the thickness of the foundation, slightly warm the edge of the latter, and press it a little thinner with a piece of clean wood, or a warmed and wetted knife. When inserted evenly in the groove, hold the frame in the left hand with the starter uppermost, slanting both downwards and to the left, so that the under side of the top bar and the foundation will together form a kind of sloping channel; now with a spoon lift some melted wax out of the melter, and pour a little on to the upper part of the channel, and slope the frame till it will run quickly down the whole length and secure the foundation to the frame. Then reverse the frame, and do the same on the other side when the strip will be securely fastened to the frame. A little practice will soon enable one to do this rapidly with a minimum of wax, for it must not be slobbered on, but the wax should be so hot and the frame so held that it will run from one end to the other quickly before it can cool. If the wax be too cool it will set before it gets the length of the frame. Full sized sheets for shallow frames for supers can be fixed this way, but many prefer to wire these narrow super frames as they get better and straighter combs by so doing.

(To be continued.)

Modern Bee Keeping.

A HANDBOOK FOR COTTAGERS.

III.—FRAME HIVES.

(Continued from page 102.)

The description already given will, if followed, produce a good serviceable hive; but there are three or four little refinements which those who

aim at perfection ought to try and introduce. It has just been mentioned that bees will fix together parts that are very near each other. They therefore fasten down the frame-ends to their resting-places. This is very inconvenient, and may be almost wholly prevented by making the frame-ends rest on the edge of a stout strip of zinc, the back and front of the hive being cut a little lower, so as to give $\frac{1}{4}$ in. space below the frame ends. This enables us to push the frames backwards and forwards on the metal strip with the greatest ease. We can also secure the correct distances between the frames by driving pins into them on opposite sides, and at the opposite ends, or by affixing strips of wood, forming what are termed broad shoulders, to the frames, and thereby preventing the bees from passing outside the zinc. The frames being made $\frac{3}{8}$ in. wide, the pins should stand out $\frac{3}{8}$ in., and the frames will fit equally well either way round. The next advance should be giving to the hive double sides, with a small space between, to be filled with dry chaff or cork-dust,* or left as air-space. The inner and outer sides joined by slips of wood at the top and bottom edges. In such hives bees winter far better than they do in single-sided ones, because the heat they produce is completely prevented from escaping; and the superior condition in which they will be found in the spring will amply repay the extra cost. The last device we shall mention here is to overcome the difficulty without which a frame from a very full hive cannot easily be removed. Several plans have been devised to accomplish this; but by making the hive wider (or longer, as the case may be, according to the direction which it is intended the frames shall take) than the ten frames require, and inserting two half-inch boards, called "*division-boards*," one on each side, and fitting close all round—either of which to be removed when examining a hive—we obtain space and avoid all danger of injuring the workers or the queen. The latter accident would always be serious, and every care should be taken to reduce its probability.

If the hive is to stand under cover it is now nearly complete, but if in the open, it must not only be thoroughly painted on the outside, but it must have some form of roof. Under this roof space should be provided for racks or sections, boxes, or glasses, all included under the name of "*Supers*," and which are intended to be filled with comb-honey. The roof, or cover, is commonly called the "*super case*." If the hives are made of bought boxes, a second box, turned over the first, will make a capital super-case; but it must be battened at its edges to keep it in position and prevent rain and snow driving in, and it must also be waterproofed above. This waterproofing may be simply done thus. Pitch the box all over the outside, and cover it with some kind of paper. Heat a flat-iron, and iron the paper down. The pitch will melt and soak through the paper, while it will run into and fill all cracks. The box so treated will remain rain-proof for years. A neater super-case can be made with a sloping roof,

We have already said that the hive should be painted outside—and this should be done three times at least—with some light colour; but, except for appearance, it is not necessary that the wood should be planed, for as it leaves the saw it will drink up more paint, will last as long, and be less likely to blister and shrink.

The addition of a couple of holes, covered with perforated zinc, will give the necessary ventilation during the extreme heat of summer, and make our super-case complete.

Short legs can be screwed on to the sides of the hive, and it will then be independent of a stand.

With one caution we close this chapter. If a swarm were put into the hive as described, it would build its combs, in all probability, across the frames rather than in them, and an examination would be impossible. To understand how perfectly straight combs are to be obtained, read "*Guides and Comb Foundation*," in a future chapter.

IV.—QUIETING BEES.

Before we can have any real pleasure amongst our bees, we must learn to control them. Some are so good-tempered, that with gentle yet confident handling, we can do almost anything with them without running much risk of being stung (this is particularly the case with pure Italian or Ligurian bees): while others are naturally irritable; but none are so cross that they cannot be subdued in the way now to be explained. All country people know how little disposed bees are to sting at swarming time. This is because they are all full of honey; and it is now well-known that whenever a bee is in this condition it will not sting unless it is actually injured.

If, then, before opening a hive, or lifting up a skep, we can make the bees fill themselves, we shall have them in our power. Blowing a little smoke amongst them will do this. It is not desirable to use tobacco, and a very little smoke will suffice. We take a roll of brown paper, or old cotton rag, or corduroy, set it smouldering, and blow some of the smoke in at the hive entrance. Startled by the smoke, the bees run to their honey, and if we lift the quilt or turn up the skep a minute or so afterwards, we shall find numbers of them with their heads buried in the cells, drinking it up as fast as they are able. We now commence to do whatever may be necessary, giving from time to time more smoke if the bees begin to show their tempers. It is very desirable to be able to give smoke whenever required, and for this purpose the owner of a few hives would find it good economy to buy a smoker. The one known as "*Bingham's*" is much better than most, if not the very best, and will burn without going out as long as the supply of fuel lasts. A veil giving full protection to the face made of coarse, black net (costing fourpence per yard). A piece of this, about 27 in. by 24 in., is made into a bottomless bag; a hem is added round the top and an elastic put in. This is worn over the hat, tucked in about the neck, and the coat buttoned up. The hands may

* Cork-dust may be bought off egg-merchants very cheaply.

be protected by very thick woollen gloves; but they are clumsy things, and the bees will sting them repeatedly when the bare hands would not be attacked. All who desire to become bee-masters will abandon gloves when they consider that every bee that stings the gloves or hands dies, and they will find the occasional stings they are sure to get trouble them less and less, until, in time, neither swelling nor irritation will follow.

Many remedies are recommended to relieve the pain occasioned by a sting, and often what suits one person will have no effect upon another, but it may be worth while to mention that when a sting is received it should be removed without pressure upon the poison-bag which adheres to it. Push the string out with the back of a pen-knife or a finger-nail, and then apply a drop of liquid ammonia to the wound. This in most cases will soon put an end to all discomfort.

One caution is necessary. Never use more smoke than is required, and avoid jarring the hive or the combs. The more steady your hand and the more deliberate your manner, the less smoke will you need. Run from a snappish dog if you want him to bite you, and keep shrinking from a threatening bee if you want a sting. Keep firm, and you will save your bees and fingers, and your smoke into the bargain.

(To be continued.)

Reports from Australian Apiaries

ORBOST.

The honey flow up here this season is something to be remembered. The mahoganys have been in bloom these last five weeks, and are likely to last five or six weeks longer. Thousands of flying foxes have arrived as soon as they began to bloom. They came to feed on the mahogany blossom. You can see the honey in them with the naked eye, and the flowers don't open all at once, but open in succession for close on three months. Birds give up robbing fruit trees and go after them. The mahogany did not bloom for three years. They do, as a rule, every other year. How is honey selling in Melbourne? I think I shall have two tons above what I can get rid of locally.

Orbost, May 3, 1889.

JOHN F. HOFEN.

Correspondence.

To the Editor of the Australian Bee-keepers' Journal.

SIR,—We have this day packed for shipment per mail steamer Victoria 8 cases of Victorian honey consigned to the Agent-General for Victoria, London. This lot is for exhibition at the forthcoming show of agricultural products, to be opened at Windsor during next month. The bulk of this packing is to order of the Agricultural Department, and comprises honey of

varied flavours gathered from different parts of the colony and at different times of the year. These samples will receive close inspection from the judges and those interested. We feel confident that this lot of honey will take lots of beating, and should command a place in the prize list. At the close of the Exhibition the honey will be sold, and proceeds remitted, so that we shall be able to judge of the probable value of our honey in the London market.

If it is at all possible to have comb honey handled carefully to insure its arrival in sound condition, the home market would probably be able to consume all that could be supplied by us. A good export trade could be opened up, which should leave plenty of room for shippers' profits, seeing that our honey could be offered at a time when little if any other honey was in the market. With the facilities now offering for safe and speedy transit, it is well within the bounds of possibility that this trade may be opened. When we take into consideration the vast resources we have in this colony, and the comparative ease with which a payable crop of honey may be secured, to which may be super-added the fact that the quality is first-class, it really seems as if this industry were going a-begging.—Yours faithfully,

B-K-S—Co.

May 2, 1889.

Extracts.

FOUL BROOD.

SPRING CARE OF BEES—HOW TO DISTINGUISH FOUL BROOD.

Written for *The American Bee Journal* by RANDOLPH GRADEN.

As the winter has been very mild and pleasant for bees, so far they have wintered well; but as the most trying time is yet to come, it is necessary to see that they have plenty of stores, for if the warm weather should continue through February, the bees will start breeding early, and consume considerable honey.

As March and April are very trying months for bees, too much care can hardly be given them, so that the brood does not get chilled. Colonies that are expected to be short of stores, or are weak in appearance, should, when the weather is warm enough to admit of so doing, be examined, and the brood chamber contracted to suit the size of the colony, and, if short of stores, they should be fed.

Colonies that are not doing as well as they ought, or are not doing as well as those around them, should be examined to see if they have a queen, and if not, a queen should be given them, or a frame of eggs and brood, so they can rear their own queen. They ought also to be examined to see if they are affected with the disease called "foul brood" (or bacillus alvei), as we hear that there is a great deal of that disease in the country

APPEARANCE OF FOUL BROOD.

In its first stages, the larvæ when attacked begin to move unnaturally, and instead of being curled around on the bottom of the cells, they sometimes turn in such a way as to present their dorsal to the eye of the observer, and it may then be noticed that the color of the larvæ is somewhat yellowish instead of being pearly white. Larvæ thus affected seldom are sealed over, but such grubs as are further advanced in growth before the disease strikes them, are in due time sealed, but as they die, their bodies turn brown and become a putrid mass, the cell sealing sinks, and a small, irregular hole may be seen in the capping. The bees may also be seen very energetically fanning at the entrance of the hive, and in advanced cases an indescribable odor may be observed; and if theappings of the diseased cells are removed, a very brown, coffee-colored mass will be seen at the bottom of the cell, which is so tenacious that if a head of a pin is inserted into the mass, it may be drawn out, a thread-like and ropy substance. The foregoing are the general indications of the disease.

PROPAGATION OF FOUL BROOD.

Foul brood is a very contagious disease, and if started, and not properly treated, so as to check its progress, it will rapidly spread from cell to cell, and from colony to colony.

As to the propagation of this disease, the conclusions are varied, and as yet not fully understood; but many of our leading apiarists have the idea that the bees, while robbing the depopulated colonies, carry the bacilli or spores on their bodies, or in the honey from apiary to apiary, and from hive to hive. Some go even so far as to think that if a bee visits a flower that has been previously visited by a bee from a diseased colony, the spores of the disease can be picked up in that way, and carried to the hive. I do not think that this is quite correct, and my reasons are these:

About three years ago I noticed a colony that was in advanced stages of the disease, that was being robbed, and upon investigation, I found that the robber bees were located less than half a mile away, and the robbing had been going on for some time, as quite a line of bees were going to and from the hive, and most of the honey from the outside frames had been carried away by the robbers; yet, strange as it may be, no disease has appeared. This shows that the honey contained no spores; also that the bees, by flying less than half a mile, carried no spores to affect the colonies that contained the robber bees. Still, when the disease is once started in an apiary, it spreads very rapidly.

Now if the honey contains no spores, the question would arise, how is the disease propagated? Would it not be reasonable to suppose that it is carried from hive to hive through the air, as an indescribable and nauseating odor is emitted from the hives where the disease is somewhat advanced? What is odor, no more nor less than very minute parcels from the substance from which it arises? and in these progressive times in bee-culture, when bees are sold by the pound, and bees and

queens are shipped and sent through the mails from State to State, and from country to country, the disease may also in this way be carried from one country to the other.

It may, after being once started, if not properly treated, become hereditary; as one of our Professors has said, that a queen reared in a foul-broody colony would not live over one year, which I know is not always correct, from the fact that I have seen a queen that was reared in a very foul-broody colony, that lived a part of three years, and lived through two winters; yet if not always treated in the brood-rearing season, her progeny would be affected, and foul brood again appear. This colony was examined in the latter part of August in the third summer of her life, and the brood was to all appearance in a healthy condition, yet after leaving them without treatment for 21 days, upon examining the colony, it was again found to be affected with the disease, and upon giving them a heavy dose of the treatment in the forenoon, they swarmed out and left the apiary, going in a southerly direction. This shows that it would be very dangerous to procure a queen that had been reared in a foul-broody colony.

I think I have shown some very good reasons as to how bacillus alvei get into a colony. It is also quite certain that very many bees of a colony may be diseased for weeks and even months with this bacillus, and yet foul brood may not be seen, as bees clear out infected grubs so that the infection may not be seen, and yet exist. As to the method of treatment, it is varied, as some use salicylic acid, and others use phenol (carbolic acid); also camphor, powdered coffee, dairy salt, and a preparation of salicylic acid, bi-carbonate of soda, dairy salt and soft water; also thyme, sulphuric acid, etc., and the "starvation plan." It is evident that the disease yields very readily when properly treated.

Taylor Centre, Mich.

SPRING MANAGEMENT.

BY ALLEN PRINGLE.

To get the bees through the spring is about as difficult a matter here as to get them through the winter. The British beekeeper, too, doubtless experiences some difficulty in this line. Our technical term for the trouble is "spring dwindling." In these two unpleasant words is summed up much of the tribulation and loss of the Canadian apiarist.

What is spring dwindling? It is the more or less rapid "shuffling off" of the worker-bees in the spring till the number left is too small to keep the house and keep life in it. Then all is up.

What are the causes of spring dwindling? and what are the remedies? It is not so easy to answer these questions as to put them. On both there are differences of opinion, but more agreement as to remedies than causes. I cannot agree to the proposition that spring dwindling is a disease, or even an abnormal condition. It is occasionally disease, or the result of disease—winter diarrhoea; but usually it is a purely natural and normal exit of the aged and worn-out bee

from the stage of life and action. Whether the exit of old bees in the spring *before* the young ones appear in sufficient force to keep house and preserve the existence of the colony is a *normal* condition or not is another question. We know that Nature does some very foolish things, and we are constantly improving upon her methods and arrangements. The dying off before the young can take charge, whether wise or otherwise from our standpoint, is natural enough. Most experienced bee-keepers have noticed with what startling rapidity the old bees will sometimes die off from a populous colony in the spring, apparently in perfect health and under favourable weather conditions. In such cases it would appear that the bees are all probably about the same age, having been hatched about the same time in the fall, and they all go off at their "appointed time" together. I have occasionally had colonies depart this life in that summary fashion, leaving a lot of young brood utterly unprotected. Of course, this is not a frequent occurrence, for the reason that brooding usually begins in February or March, and the young bees are thus present to take the place of the old ones. I have noticed that some strains of the Italians are slow in brooding in the spring, and defer the business till they begin to dwindle, and it is too late.

What are the remedies? First amongst them is a good young queen, so that the young bees may come forward in the spring fast enough to take the place of the dying old ones. This is only one of the advantages of young, prolific queens. In a conversation with Mr. Cowan on queens in the fall 1887 in Toronto he said, if I remember aright, that he only kept his queens two years before superseding them—in fact, less than two years, as they were reared late in the honey season, and simply kept through the balance of that season and the next. I was much surprised at this information, as, if I mistake not, Canadian and American beekeepers were in the habit of thinking a queen's prime usefulness not gone till she had put in about three years of service on an average. Some, of course, failed at two. Possibly the Canadian queen wears longer than the English, but, taking climate into consideration, I should think the reverse ought to be true. I am, however, in favour of young queens, and am inclined to think that the extra trouble and expense of early superseding will be more than counterbalanced by the accruing advantages.

One thing is certain, however, if this is a good thing, with profit in it, the advocates of *natural* superseding are sure to be "left," for a majority of colonies left to themselves in this manner will usually keep their queens three years before superseding them, and sometimes four or five years. The apiarist must, therefore, take the matter in hand himself, or take the unprofitable consequences.

Next to a prolific young queen, in avoiding the effects of spring dwindling, is abundance of wholesome stores; and next come the proper temperature, and other conditions for early moderate spring brooding. With these three prime requisites present, the beekeeper has little to fear from the dreadful "spring dwindling."

Two other important factors in successful spring management are cleansing the hive and keeping the brood-nest warm and comfortable. Whether the bees are wintered in a repository or in the open air, every colony ought to be cleansed or "cleared out" in the spring the first suitable weather. The best way to accomplish this is to start with a clean empty hive to hold the first colony, when its hive can be thoroughly cleansed and prepared for the second, and so on. Frames, bees and all, can be lifted out, one at a time, the adhering dead bees on bottom bar brushed off with a feather or wing, and gently placed in a clean hive, when the familiar hum of joy and satisfaction will soon ascend to your ears.

But, above all, keep the brood-nest warm during the chilly days and nights of spring. This is rendered imperative by the rapid disappearance of the old bees at this time, and the consequent diminution of the natural heat in the hive, which *must* be retained by proper packing and contraction of entrance, or "chilled brood," and possibly the loss of the colony, is the result.

"Stimulative" spring feeding as a supposed necessary part of spring management is not now so much practiced as heretofore. While it may be advisable in some cases of inferior queens and backward brooding through deficient stores, it is not at all necessary with good queens and abundant stores.

At the time of overhauling and cleansing the hives, my practice is to take away empty frames of combs and crowd the bees up into snug and smaller quarters, leaving the colony on two, three, four, or more frames, according to its strength. These may be replaced in the hive from time to time as required.

What is called "spreading of brood" in the spring to hurry up brooding is unsafe with any but the experienced, and is not to be recommended. When adding needed frames from time to time, I prefer to leave the brood-nest intact and make the additions on each side of it. The frames thus added generally contain more or less honey, and it is often desirable to uncap, or partially to uncap, that side facing the brood, when the queen will promptly do her part. When the temperature and other conditions justify and call for it, a frame of honey may be thus uncapped or abraded and placed in the centre of the brood-nest to be filled with brood. This is about all the spring stipulation necessary, or safe, where there is a good queen and plenty of food. But the queen ought, in my opinion, to get abundance of room and have full swing up to the beginning of the heavy flow, when her area ought to be curtailed; but about this "contraction of brood-nest," which is a disputed point, in next letter.—*British Bee Journal*.

THE BEES OF BORNEO.

[2035] The genus *Apis*, the honeycomb builders, may be conveniently divided into three pairs,—the small bees, the big bees, and the medium-sized bees.

1. The small bees, whose workers are less than three-eighths of an inch in length; their nest is exposed attached to a twig from six to fifteen feet above the ground. It consists of a single small comb, which the bees, when frightened, temporarily forsake. The queen is at once distinguished by the comparatively enormous size of her thorax; the drones, too, are very different from the drones of other bees, the dense velvet down on the thorax being wanting, and the abdomen narrower and more curved, but most curious are the large blunt lobes or pegs on the tarsal segments of the posterior legs, arising from its anterior upper margin and passing downwards, no rudiment or trace of which can be seen in ordinary drones. These bees are found only in tropical Asia and the islands of the Malay Archipelago; owing to their small size they are of no use to beekeepers or to bee-hunters. Only one species is known, *Apis florea*.

2. The big bees, whose workers are more than five-eighths of an inch in length; these, too, have their nest exposed, and composed of only a single comb, but this a large one, and generally placed on inaccessible cliffs or large unclimbable trees, though occasionally in more accessible places. Owing to the position of their nests and the size of their stings these bees can successfully drive off all enemies by day. They, too, are found only in tropical Asia and the islands of the Malay Archipelago. Owing to the quantity of wax in their large comb, it is highly valued by natives, but these bees are not domesticated. *Apis dorsata* is the common, well-known species found as far eastwards as the isle of Timore. *Apis zonata* is a little known species, found only, I think, in the Island of Celebes.

3. The medium-sized bees, whose workers are more than three-eighths of an inch and less than five-eighths of an inch in length; their nests are always sheltered in hives, in hollow trees, in roofs of houses, or some such places; they build several parallel combs, they consist of species, varieties, and races, scattered over the whole of the habitable old world.

Apis indica, the smallest and one of the most distinct, is found in tropical Asia and the islands of the Malay Archipelago.

Apis unicolor, small, dark in colour, and distinct from others, is found in Madagascar.

From Africa comes *Apis adansonii*; from Egypt, *Apis fasciata*; from Europe, *Apis mellifica*; from China, *Apis sinensis*. Almost every country has a special variety or race; sometimes these, when brought together, interbreed, but sometimes two can be found in the same country which appear to keep distinct.

Up this Sarawak River are four species of *Apis*—

1, *Apis florea*.—I saw this bee in Ceylon, it seemed rare in the hill country, but very common near Anuraadhapoor, where, on their nests being disturbed, the bees fled without stinging, so that Cinghalese boys have no difficulty in eating their honey, and Mr. Davison tells me that the same is the case in the south

of India; but here, although the bees readily leave their combs, they will sting as well and more effectually than their size would lead one to expect. I have not yet caught a drone here, for the wet season is on, and there are no drones now. The workers of these bees vary greatly in the colour of their abdomen, the most common thing is for the two basal segments of the abdomen to be coloured, and the others black, but in the same nest will be found some without a bit of colour in the abdomen, and some in which nearly all the segments of the abdomen are coloured. Has Mr. Benton been guilty of this atrocity, or will some amateur detective find another culprit in this matter?

2. *Apis dorsata*.—I have not noticed any difference between this bee and the one like it which I saw in Ceylon, except that in Ceylon it was quite absent from the flat country round Anuraadhapoor, but here is common both in the low country and in the hills. The workers usually have the two basal segments of the abdomen coloured, the other segments black, except for a gray band quite at their base; but some workers have the third segment coloured, and some have the whole upper surface of the abdomen coloured. I saw quite a number of these last on a nest I examined through a telescope, but could see no drones, I suppose because it is the wet season, yet swarms of these bees are frequently seen flying overhead.

3. *Apis indica*.—The commonest bee here, length of the worker seven-sixteenths of an inch; these bees do not vary much in the colour of the abdomen, in the majority the scutellum is coloured, but in many it is not. At this time of year there are no drones. The bees do not store much honey, they have no winter to go through, and many enemies, so they prefer breeding and swarming. They are very quiet bees, quieter than two colonies of *indica* which I examined in Ceylon; they can be easily manipulated without smoke, but they readily take to the wing—the queen as well as the workers—so that it is impossible to drive them. Four times I have tried transferring to bar-framed hive, and once the simple removal of the queen, in every case they forsook the hive and all their brood a few days after, but the wet season was on, and the quantity of their brood not large. Amongst the enemies to these bees is a species of *Trigona*, yellow and black, and small in size, this, finding its way through the cracks in a Dyak hive establishes itself in the upper regions of the comb, builds a wall between itself and the owners of the honey, behind which it eats the honey, leaving the midrib of the comb quite bare, and in places destroying this too. I opened two hives attacked by this small bee, and in neither case did I find any of their brood, but the Dyaks thought they sometimes had brood in the hives, but say that a few months after the *Trigona* comes the *Apis* generally forsake its hive.

4. *Apis flava*.—The proper name of this bee I do not know, so for the present I will use the above name; the workers are at once recognised by their bright yellow colour; their head is

yellow, their thorax densely clothed with long yellow hairs, and the ground colour of the thorax is yellow, their length is nine-sixteenths of an inch, slightly larger, I think, than an English bee. The drones are not very yellow, the queen not at all so. She is but little larger than a queen of *indica*. I have examined three nests of these bees, in one were drones hatching and hatched, the drone cells, though larger than the worker-cells, and furnished with the convex capping, were mixed irregularly with the worker-cells, not together on a special portion of comb. The colonies are small, and not quite so good-tempered as those of *Apis indica*, but with the help of smoke are not difficult to deal with. Whilst manipulating I noticed *Apis flava* trying to rob from *Apis indica*; and I have seen *Apis indica* trying to rob from *Apis flava*, but I have not seen *Apis dorsata*, or any wasp out here, trying to rob, though *Apis dorsata* frequently comes to drink close to my colonies of *Apis indica*.

Malays, Chinese, Klings, and Europeans, here all give bees a wide berth. Dyaks alone keep them. Their knowledge of their habits is much like that of the old Romans; they talk of the Rajah, though probably few have seen him. The drones they call *hadorken*, but have no idea that they are the males, or that the rajah lays eggs.

A nest of *Dorsata* the Dyaks highly value. They eat the brood, but sell the wax, and the honey too, if they can, to Malays, who trade up the river. They take the nest by building ladders up the tree or cliff. Ascending these on a moonless night, they hold a torch beneath the nest, and drive off the bewildered bees before cutting down the comb. Next day the bees leave the place and try their fortunes elsewhere. There is a right of ownership of nests on favourite trees or cliffs. Colonies of *Apis indica* they keep in hives made of bark, or hollow logs of wood, narrow, but two or three feet long, with the entrance in the middle, suspended lengthwise from the floors of their houses, which are raised many feet from the ground on poles. They take the honey and brood at night, driving the bees out of their hives by means of smoke. Next day the bees leave the place. *Apis flava* they seldom put in hives, for they say it gives less honey and brood than *Apis indica*. *Apis florea* I believe they usually avoid.

The Malays call *Apis florea* 'Peniangat,' a word which is applied to small social wasps also, and is their name for the sting of an insect. The Dyak name is 'Titi,' which is also used for small solitary bees. *Apis dorsata* is called by Malays 'Lauyer,' by Dyaks, 'Banyee.' Dyaks cannot pronounce L except at the end of a word, so when speaking Malay they say 'Banyee.' *Apis indica* is called by Dyaks 'Nawaan,' or often up other rivers, 'Ranawaan.' The proper Malay name is 'Lebah,' but I have not heard it used here, the Malays commonly using the Dyak name. *Apis flava* is distinguished by Dyaks as 'Nawaan pschea' (?), or the 'yellow Nawaan.'—G. D. HAVILAND, *British Bee Journal*.

SECTIONS AND SECTION SUPERS.

DR. G. L. TINKER.

Bee-keepers are steadily approaching a standard section honey box—the one-pound. The tendency is also to a uniform size, the $4\frac{1}{4} \times 4\frac{1}{4}$, and also to have a uniform width, the $1\frac{1}{4}$. Such a section, having open sides, and used with separators, will average one pound in weight.

It appears to be well settled that as much comb honey can be secured in the one-pound package as in any larger size, and since the one-pound is the most popular in the markets, it is likely to become a standard, as all other sizes of sections are gradually but surely going out of use. This fact is shown by the steady and increasing demand of supply dealers for the one-pound packages.

It is well known that the linn or basswood is the only white timber from which one-piece sections can be made. It is also largely in use for this purpose, which is the more unfortunate as the basswood is one of the best sources of honey for our bees. It is not an exaggeration to say that when this tree, as it now stands in the large forests, is destroyed that the production of honey will become unprofitable, unless artificial pasturage can take its place, which is doubtful. The rapid and increasing destruction of the basswood is already causing serious apprehension in the minds of many of our best bee-keepers. Mr. H. R. Boardman, whose foresight and ability none will question, stated to the writer not long since that the basswood in his locality was rapidly being cut down and used for sections. It was a question of only a few years when this source of nectar for his bees would be destroyed, when he doubted if bee-keeping would not cease to be profitable. And I find that this same estimate of the value of the basswood to bee-keepers is held by many others.

At the present time bee-keepers are the largest consumers of the basswood, and every man who uses the one-piece section is encouraging its further destruction. It seems to me that such bee-keepers are standing in the way of their own future success, when self-interest should discourage, as far as possible, the cutting down of basswood timber. Bee-keepers should guard with jealous care the trees yet standing in their localities, and in many instances valuable trees may be spared with proper effort.

If the one-piece section had any great advantage over the four-piece dove-tailed section, in the way of obtaining a larger surplus, there might be some justification for its use, but no such advantage exists. The only advantage claimed is that the one-piece section can be put together a little quicker than the four-piece. But it often happens that, owing to many breakages, the four-piece section can be put together the most rapidly. Certain it is, that the saving of time in putting together the one-piece section is not a serious item, when a few boys at twenty-five cents a day can put together, for a small outlay

and in short order, more four-piece sections than any of our largest bee-keepers can use. I always employ small boys to put my sections together, and they like no better fun.

But the one-piece section is always a frail affair, and it is next to impossible to make them true. On the contrary, the four-piece, if properly made, is much the stronger, and it is easily made perfectly true, both in size and width. Again, unless the former are securely clamped in the super, they will speedily assume a diamond shape and become both unsightly and difficult to crate.

Lastly, the white poplar makes the most beautiful section. It is a whiter wood and not so easily soiled as the basswood. Owing to its being a very brittle wood it cannot be made into the one-piece sections. It must be made either dovetailed or to nail. As the white poplar is worth almost nothing for any other purpose, and makes the best section by far that is made, it is a marvel to me why any bee-keeper should use the one-piece section.

There is another timber, the *white gum*, growing extensively in this country, that makes a nicer section than the white poplar, but it is more difficult to work. The wood is heavy and very fine grained, taking a high polish from a properly fitted circular saw. Some of it is almost as hard as white hickory; but for that matter I can make beautiful sections from the hardest white hickory. Some of the gum trees are brash and soft, and I am sure can be worked as easily as the white poplar. The white gum makes the best and nicest shipping crate that is made. It holds a nail securely and is less inclined to split than the white poplar.

For years I have sought a section or surplus arrangement by which as much comb honey could be secured as by the use of brood frames in the supers. At last I can say to bee-keepers, I have found it. It is the use of open side sections. At last it can truly be said that no loss in comb honey is occasioned by the use of a small package, if so constructed as to favor the work of the bees. And only by providing the freest communication to all parts of a section super can this be done. Numerous closed partitions in a super are so many barriers to the work of the bees, and will evidently result in a diminished product. An item of the highest importance in the construction of a super is to provide free ventilation from end to end and side to side. The nectar brought in by the bees usually comes with a rush, and it is fully one-half water, which must be evaporated. It is carried at once to the rapidly-growing combs of the sections, and if a draft cannot be easily made through all parts of the super the ripening of the honey must go on slowly and by increased and protracted labor of the bees. No wonder they often get discouraged in working in the old style of closed side sections, and often hesitate to make a start in them. The one advantage will many times offset any alleged advantage in handling closed side sections. But the open side section has numerous other advantages over the closed sided. The edges of

the combs are built out even all around and the section is perfectly filled. The closed side section is rarely built out square to the uprights of the section, even in a good honey flow; but the bees are apt to leave a bee space between the uprights and the edge of the combs, except a thin attachment in the centre. With the open side sections the bees always build the edges of the combs straight out to the uprights, and as a result put more honey in them than in the same sized closed side section. Hence it is then an open side section, $4\frac{1}{2} \times 4\frac{1}{2} \times 1\frac{1}{2}$, will weigh on an average as much as a closed side section $4\frac{1}{2} \times 4\frac{1}{2} \times 2$. Again, with closed side sections, it is seldom that the sections at the ends and sides of the super are filled out as perfectly as the central ones. But the open side sections fully and completely overcome this objection. The end sections will be filled out as perfectly as any others, and no one-sided combs are built.

In a moderate honey flow the bees take the central rows of sections first and follow the separators, the central end sections being completed about the same time that the centre sections are; the sections at the side of the case being the last to be completed, the tendency being to complete all sections in which work is begun.

After years of experience in the endeavour to succeed in obtaining well-built combs in sections without separators, I gave it up, and I have resorted to every known expedient. I prefer wood separators, sawed 1-16 thick, and if made as wide as the section is high, they give most excellent results. In the use of a section $1\frac{1}{2}$ wide this requires that the top and bottom bars should be only $1\frac{1}{8}$ of an inch wide, thus securing a passage way $\frac{1}{8}$ inch wide each side of the separators. I also wish the separators perforated opposite the openings in the side of the sections. For this purpose a $\frac{3}{8}$ inch augur hole answers every need, and is never filled up with brace combs. With sections and separators so constructed every section has twelve openings into it for the passage of the bees and for allowing free ventilation.

However the super may be constructed otherwise, the above points are first essentials, as they are requisite to the successful working of the bees. In all other respects, a super should suit the convenience of the bee-keeper for ease and rapidity of operation. For this purpose I have found nothing better than wide frames, one tier high, probably supported in a case. This requires also that the side of the super be removable, and retained in place by an adjustable hook at each end of the case. The most practicable device of this kind that I have used is the invention of Mr. H. D. Cutting.

That the wide frames may be made light and yet not sag with the weight of honey in the sections, I place a bar or post in the centre of each frame so that both the top and bottom bars of the frames aid in supporting the sections. So constructed, the top and bottom bars require to be only 3-16 thick and $1\frac{1}{2}$ wide. Such frames are cheap and afford every desirable facility in

handling four sections at once and the removal of sections as fast as completed. The separators are not made fast to these frames, so that it is an easy matter to shake the bees off from a frame of sections, and the centre bar prevents any liability of the sections being thrown out of the frames from shaking them. I leave the sections in the frames until ready to crate them for the market. They are then easily forced out of the frames by placing a block the size of two sections beneath and pressing the frames down.

The principal objection I have to the T super is that the whole case must be left on the hive till all the sections are completed, for only one section can be handled at a time, and that with great liability of injuring the combs, even by the most careful. But it is not practical to take off one section at a time in a large apiary, so that all the sections must be left on till all are completed, and when, as is often the case, the honey comes in slowly, the centre sections are liable to be soiled by being travel stained when left on too long. Besides if the top and bottom bars of the sections are exposed, they will be more or less soiled.

Again, the T super cannot be made to work right with the open side section and wood separators as above described. It is admitted that it works fairly well and is very cheap for holding the closed side sections.

As more T supers would be required to run an apiary than of the wide frame supers, the claim is made that although a little cheaper than the latter, the cost of the number required for an apiary is about the same, with all the advantage of facility of operation on the side of the wide frame super. I may add that after a trial of a great many kinds of section supers, I have found none that give the perfect satisfaction of the wide frame super.

The advantage of storifying supers is fully recognised and no super is perfect that does not admit of being raised up and an empty one placed beneath it thus permitting the use of as many sections on a hive as may be desired,—

Beekeepers Review.

PAINTED V. UNPAINTED HIVES.

FRIEND DOOLITTLE GIVES US SOME VALUABLE FACTS IN REGARD TO THE MATTER.

As the season of the year for painting hives is drawing near with us here at the North, and has probably already come to our brethren of the South, I thought a few words on the desirability of our doing so might not be amiss at this time. It will, I think, be admitted by all, that hives look better, and will last longer, if painted, than if left unpainted; but I mistrust that \$15.00 a year will sustain more hives if spent for lumber alone than if spent for paint and lumber; yet when we take the looks into consideration, probably there is little difference in favour of either, providing that the bees would do as well in one as in the other. In this respect, I consider the unpainted hive

much better suited to the wants of the bees, and contend that bees will not do nearly as well in painted hives as they will in an unpainted one. Wherein is an unpainted hive better than a painted one? Principally in this, that, if properly covered, it will keep the bees dryer at all seasons of the year, and, owing to this dryness, they are consequently much warmer. As unpainted wood is porous, the moisture evaporates through all parts of the hive, keeping the bees warm, dry, and quiet, thus avoiding an undue consumption of honey, as well as bee diarrhea. Several years ago I had a number of box hives, some of which were painted, while others were not. I set them out of the cellar about the first April, in as near an equal condition as could be. In the morning after every cold frosty night, there would be water running out of the entrance of those that were painted, and on tipping them up the combs were found to be quite wet near the outside of them, or next the walls of the hive, while those in unpainted hives were dry and nice, no water ever showing even at the entrance. Those in the unpainted hives increased in numbers faster, and swarmed from one to two weeks earlier, than did those in the painted hives.

"But," says one, "I use corncobs, cut straw, forest leaves, and other absorbents in the top of the hive, to get the moisture out, by letting any excess that may arise pass through them and out at the top of the cover." This will help some as far as the moisture is concerned; but if not done on a scientific plan, it will let out much of the heat by such a direct draft process, which should be retained in the hive. Even if done properly, I can not help thinking that hives will keep bees better if unpainted, because in this case the moisture passes out of the hive in all directions. Paint is useful only so far as looks and durability are concerned, and is positively injurious as retarding the evaporation of moisture. This is the result which I have arrived at, after years of experience and close observation with single-walled hives, and I believe the damage is greater by far than the cost of a new hive occasionally, where ordinary hives are used.

So far I wish it understood that I have been speaking only of such hives as we used a quarter of a century ago, and not of the chaff hives of the present day. With the advent of the chaff hives came a new era in bee-keeping, and the case with these is entirely different, along this line of painting, than with the single-walled hive. With the chaff hive the moisture is driven through the first wall, which is always of unpainted lumber, just the same as it would be in case of an unpainted single-walled hive, after which it lodges in the chaff or other packing, from which it passes out slowly through any crack or crevice which may exist in the outer shell, and more largely about the joint in the top of the cover and between the cover and the hive. I use a cap or hood six inches deep, on all of my chaff hives, while directly over the bees is a sawdust cushion, which is only four inches thick. This cushion extends out over the chaff packing only an inch or so on all sides, or only sufficient to make sure that all the upward ventilation that can possibly exist

must pass through this cushion, and also so as to make sure that no bees can get up into the cap. This leaves the larger share of the chaff walls uncovered except by the cap, so that whatever moisture escapes through the walls of the inner hive into the chaff can at once pass up into the cap, and out through the cracks of the same, in all mild weather, which it also does to a certain extent on very cold days; yet in zero weather, where the same last for several days, I will find the inside of the cap all frosted over, which shows what an amount of moisture is continually passing from the bees. I think that, from this passing-off of the moisture as given above, comes the reason, largely, why bees winter so much better in chaff-packed hives, rather than that the extra protection has all to do with it, as some claim. Bees can endure any amount of cold which we ever experience in the U.S., provided they are kept dry; but dampness and wet they are not able to stand, where cold is added to it. From this comes the reason that bees winter tolerably well in a warm damp cellar, while with the same degree of dampness outdoors they generally perish; or if such surroundings in any place where the mercury stays below the freezing point for any length of time, as it necessarily must in our Northern clime. In this we get a little clue to add to the others, which, as a whole, causes our wintering troubles, for I believe these troubles do not rest on any one thing entirely. In accordance with my belief, as expressed in this article, I paint all of my double-walled or chaff hives, and leave all of the rest unpainted, considering that in doing so I am as near right as possible, taking all things into consideration. If any of the readers of *Gleanings* think that I am wrong, a trial of a few hives in each way will convince them which is right.

G. M. DOOLITTLE.

Borodini, N.Y., March 1, 1889.

Gleanings in Bee Culture.

MINORCAN BEES.

In July last we announced that through the kindness of Mr. F. C. Andreu there was a probability that the qualities of Minorean bees would be tested in England. The queen, which was transmitted to Mr. Abbott, was safely introduced; and we have a further report from him in August that the queen had done well, and that he had been able to raise a number of young queens; but, owing to the bad season, there had been a difficulty in getting them fertilised, only one out of fourteen raised proving fertile; also, owing to the weather, although Mr. Abbott had induced the queen to lay a large number of eggs in drone cells, he could not persuade the worker bees to rear the larvae, although they were well supplied with food. Mr. Abbott does not enter into the merits or demerits of the Minorean race, as they have had no chance at present of showing what they are. Our correspondent, Mr. F. C. Andreu, had stated they resembled Carniolans, but it will be seen from a letter in our columns this week that he corrects his

former statement. He also alludes to what M. Bertrand says in respect to these bees in the *Revue Internationale*. We have had an opportunity of seeing these bees and found them different in appearance to Carniolans, resembling more closely our common bees, except that they are much darker, almost black, and appear to have a more glossy surface. We cannot say much for their temper, which appears very different from that of Carniolans. They seem much more irritable and inclined to sting. Of course there will be a difference in various colonies in this respect, and, like Cyprians and other stinging races, those hives containing the youngest bees will be the quietest. That they are very free with their stings we have abundant evidence, although we have not ourselves felt it. The sting is a mild one like that of Carniolans, or a virulent one like that of Cyprians and Syrians. Mr. Andreu assures us that they are mild in disposition and easily handled.

When we examined the bees a short time ago, it was on a cool day, and as soon as the quilts were removed we found that, whilst the other races of bees were all singly and compactly clustered, and that they were hardly stirred by the disturbance, the Minorean bees were spread over the combs, were much more vivacious, and flew out to resent the intrusion. Numbers of bees ran out at the entrance, whilst with the other bees not one was seen to leave that way. A smoker was not used in either case, so that all had the same treatment.

We were much interested in the peculiar barricade constructed in front of the entrance, and which we find quite different in appearance to anything we had seen before. The barricades were built up apparently of the usual materials, viz., propolis and wax, and extended the whole length of the entrance, which was about eight inches long. We have seen bees build barricades to protect themselves against robbers and also the death's-head moth; but in such cases the inside of the entrance is filled with propolis and wax, and a hole left here and there just as the bees seem inclined. In these barricades there is a regularity that is most beautiful, and has called forth the remark from one correspondent that "they seem for all the world the work of engineers learned in the art of self-defence." In this case the barricades form a regular trellis each hole being nearly one-quarter of an inch wide or just large enough to allow a bee to pass, and having an upright bar of about one-eighth of an inch wide between each hole. When we first heard of these barricades the idea at once occurred to us that they were probably intended to keep out the rose beetle (*Cetonia Aurata*), very common to the South of Europe, and that the habit was probably inherited.

We are told that in Minorea the practice is common for the bees to systematically and scientifically barricade the entrance in the autumn. It is very interesting to find that the bees when first transported to another land carry on the same practice, for this was the only hive in the apiary that had built barricades. We think it shows that the habit is inherited

and transmitted from one generation to another, because there is a use and necessity for it. As the bees are possessed of a certain amount of intelligence we shall expect to find that they will drop this habit when they find that they have not the same need for their barricades in their new circumstances. With us the rose-beetle is not so plentiful that it should be reckoned as an enemy of bees, and therefore shall expect that the bees in time will abandon the barricading. They will not probably do so at once, but may take several generations before they entirely give it up. Of course, if the race is crossed the habit would probably be bred out very rapidly. We should be glad to hear whether the Minorcan bees reared by Mr. Abbott and other gentlemen have been noticed to possess this peculiar characteristic. We do not think the bees have been tried long enough out of their native country to speak positively as to their good or bad qualities; at any rate the past season was too bad to give them a fair chance.—*British Bee Journal*.

HYBRIDIZATION BY BEES.

(BY A MILDURA GARDENER.)

In a recent issue of the *Cultivator* there appeared a note from the *Massachusetts Ploughman* about the hybridization by bees. It was asserted that bees, when gathering honey, visit the same class of flowers until this source of supply gives out, when they look for fields and pastures new. As an example, apple trees were mentioned, and it was said that through this habit of visiting the same kind of plants hybridization was prevented. I suppose the reader to be fairly well acquainted with the process by which fertilization takes place. We will, for example, stick to our apple trees. Supposing there are ten varieties grown, the bees will visit one as well as the other, carrying on their legs and hairy body the fertilising element (the pollen) with them. It is clear that by these means hybridization between the different varieties is possible, in fact takes place. It is a well established fact that bees, and insects in general, have a large share in, and in some cases are indispensable to fertilisation. It may not be generally known that the pollen of some plants keeps its fertility for a considerable time, so it is just possible that some pollen of an early flowering species may, adhering to the body of an insect, be eventually transferred to a late species, and so fertilise it. This power of the pollen has in many instances been used to raise new varieties between species of a different time of flowering. To prevent hybridisation it is essential to have the plants from which it is desired to raise seed perfectly isolated from all external influences. They have to be sheltered from the slightest wind, and covered with wire or mosquito netting of the smallest possible mesh, to prevent insects visiting them.

Mildura Cultivator.

EUCALYPTUS HONEY: ITS PROPERTIES.

Beekeepers will be pleased to see it announced upon the high authority of Mr. T. Christie, London, in "New Commercial Plants and Drugs," No. 11, that eucalyptus honey is destined to figure as of great importance both as nutriment and as a therapeutic product. Analyses of the honey by Mr. C. Herisson, director of the Chevrier Laboratory, Paris, show that it possesses all the valuable principles found in the Eucalyptus tree. The analysis shows:—Sugar (mostly laevulose), 611.6; ash, 1.8; moisture, 215.6; active principles of eucalyptus, 170.0; total, 1000.0. Various attempts were made by Mr. Herisson to artificially obtain this honey by mixing the various ingredients together with ordinary honey, but it was found that no amount of careful stirring, and other treatment, would prevent the active principles of the eucalypt from separating and gradually volatilising. Eucalyptus honey, filtered at a temperature of 68 deg. Fahr., presents the appearance of a thick transparent and homogeneous syrup, of a deep orange colour, with an odour which at once points to its source. It is very soluble in milk, water, and wine, but less in alcohol; it is difficult to ferment on account of the large proportion of sugar it contains. Its action upon dogs, when given in milk, produced a slowing of the heart's action, and a surprising diminution of the pulsations; in one case from 124 to even as low as 70 per minute. Upon himself the doctor found it, if taken in warm milk, to yield a most pleasant beverage, and to produce, after a few minutes, an agreeable sensation of warmth in the body, the active principles of the honey being eliminated through the larynx and the bronchial tubes, rendering the voice clearer and more resonant; and the breath became perfumed and the lungs acted in a freer and more elastic manner. After taking the honey for a week the doctor said he could take violent exercise without any strain being felt. "Eucalyptus honey," says Mr. Christie, "with its 612 parts per thousand of pure sugar, will take a leading place among nutriments; it will prove an important substitute for cod liver oil in cases of bronchitis, phthisis, &c., while as a sedative to the heart, as a febrifuge, as an antiseptic, and antiparasitic, it would appear to be second to no other product." This is indeed high praise, and we hope further experimentation will endorse the conclusions drawn from Mr. Herisson's studies. Mr. Christie mentions several instances of its good effect in cases of whooping cough; also in typhoid fever and bronchitis.—*Queenslander*.

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Editorial.

HINTS FOR SEPTEMBER.

WITH September commences the busy season for beekeepers, for in favourable weather, even in the Southern districts of Victoria, swarms may be expected any time after the second week, and in many inland districts, even a fortnight or three weeks earlier; while, in hill and mountain apiaries, the first swarms are frequently delayed till December. As stated in our last number, the first beginning of the breeding season is always a trying time for all stocks that are not strong and well furnished with stores. In looking over our hives on any fine day about noon, we are able to judge by the business going on at the entrance whether a hive is populous and prosperous, or weak and requiring help. In front of some colonies we may, perhaps, see an unusual number of dead bees just beneath the alighting-board, and probably see bees dragging out their dead or dying companions, and dropping them to the ground. Such cases should be looked to at once.

We advise that all hives which appear weak, or have any more than a very few dead bees about, should be carefully examined the first fine and warm day after the 20th of August, to ascertain as far as possible the cause. *Queenlessness* will often be found the reason of weakness, and should be dealt with at once, either by introducing a queen and feeding freely, or by uniting with another weak stock having a queen.

Want of food may be found to be the cause, little or no honey in the combs; in these cases feed pretty freely every evening, and better with syrup, or thin honey given warm. It is wonderful how such stocks are invigorated by a little care of this kind.

Perhaps disease may be discovered, either foul brood or one of the spring diseases. The first can be easily detected by the dirty look about the centre of the combs, some with a dry brown substance filling the bottom angles of the cells,

and some with old cappings covering scattered cells, which, when opened, display a brown mass, which has a fetid smell, partly filling them up. These signs will be those left from the autumn brood, and will almost certainly develop the disease in a virulent form as soon as the first spring breeding has set in. To grapple with such cases, unless the hive be fairly populous and the queen a good one, is often hopeless. The best plan is to feed freely with warm syrup every evening, and, directly the queen commences to lay, remove the hive from its stand to some little distance—say 20 or 30 yards—away, put a new hive with 4 or 5 frames, with starters only of foundation and some warm syrup in a feeder, on the old site, then shake the queen and bees off each frame of the old hive into a separate box (an old gin case or a swarming box will do well). Many bees will fly and go back to the old spot and enter the new hive, while most of them will remain in the box with the queen. Now take the box and bees to the new hive, and prop it up in such a way that the bees can easily crawl out on to the alighting-board of the new hive, which they will quickly take possession of, and, encouraged by a plentiful supply of warm food, will commence comb building and a new start in life, and, if the queen has not already become diseased herself, will rapidly thrive and remain healthy. If the queen, however, has contracted the disease, it will constantly break out again. It is, therefore, good policy if the stock be a good one, to give it a new queen at once if the rising brood shows any signs of disease, which can be seen by the larva and more advanced grubs presenting a slightly yellow, instead of glistening, pearly white tinge.

If the colony affected is very weak, and the combs strongly infected, our advice is to destroy the bees with sulphur, burn the combs and frames, and scald the hives.

The spring diseases are sometimes difficult to cope with. First we must see if we can find any cause for it, such as damp, dirt, mildewed mats or combs; if so, remove these causes and feed, as before, with fresh, warm syrup, with a

little salt. In cases where the bees are dying in numbers, while there is plenty of old honey in the hive, we have found taking out the frames of combs and giving them others without honey or pollen, and feeding slowly with warm syrup, to frequently bring them back to health; the combs of honey taken out, if entirely free from foul brood, can be given to freshly-hived swarms later on. Some of these cases of spring disease go hopelessly from bad to worse, and eventually die out altogether.

Even the manifestly strong colonies should also be looked to, all dirt and debris, old propolis, projecting pieces of combs, &c., cleared out, the frames adjusted a little closer, and, if necessary, clean new mats should be put to replace the old ones.

It is a matter of great importance to those keeping bees for profit that all their stocks should be strong and in good working trim by the time the first honey flow comes on, and to secure this, a little care and attention at the beginning of September, or latter part of August even, will be found the best course. After seeing the hives trimmed up as already advised, the frames nicely spaced not more than half-an-inch from centre to centre, ascertain if there is plenty of honey left, because the consumption will be great immediately the queen commences to lay. If there be plenty of sealed honey, break the sealing of a good portion of it by scraping slightly over the cells with the edge of a knife, or by any other method, so that the honey in a great number of cells is exposed to the bees, for it is remarkable how unwilling the bees in some hives are to unseal honey until driven to it. The slightest bruising of caps diffuses the odour of honey, and the queen and bees get as pleased and excited as if they had discovered new stores, the queen is thus induced to lay more freely, and young bees will be hatching just when extra strength in the hives is wanted. Of course if honey is scarce in the combs feeding freely with warm syrup in the evening as already advised, will be found a profitable proceeding.

Swarming.—We have come to the conclusion that it is best for an apiary all round to allow the bees to swarm once at least without any hindrance, and if the season is good and stocks strong and increase is wanted, a second swarm may be allowed, but further swarming should be prevented, but if third swarms do issue they should be returned after clearing out all queen cells and destroying or removing all but one queen. Generally speaking however it will pay best as far as honey production is concerned, to stop all second swarms by any of the usual methods such as giving a young queen to the stock a day or two after the first swarm issued, or cutting out all queen cells but one which is left to hatch. By the latter method however, valuable time is lost at the busiest season; first because breeding will cease till the queen is hatched, mated and commences laying, which often amounts to three weeks from the time the swarm came out, and second it frequently happens that a young queen gets lost when she leaves the hive for mating. The introduction of a young fertile queen directly after swarming is therefore the best plan where queens are reared in the apiary.

A FEW HINTS TO OUR READERS.

We must again ask our readers to send in all the Beekeeping news they can. The reports we sometimes get from the owners of apiaries are very interesting and useful to Beekeepers working for profit.

There are many items of importance which we feel sure numbers of our readers could supply us with, and no matter how trivial the information may appear to the sender, it may perhaps be very important to us.

There is one item of information concerning which we are very desirous to get reports, and that is the dates at which different honey producing plants, and especially shrubs and trees commence and end blossoming in various localities; for we find the same kind of gum tree or shrub comes into bloom at quite a different time of year in one place from what it does in others. A good knowledge of this kind will help the Beekeeping industry immensely, and if all our readers would do their best to give us the information for their own particular locality, we shall be able to write with confidence on this point, and give to bee farmers, and those entering upon apicultural ventures, the information they most need.

Original Contributions.

There are many objects noticed in modern beekeeping which would, no doubt, interest many intelligent people who are strictly speaking not beekeepers, but which among the uneducated are not heeded in the least. For instance, where is there among bipeds or quadrupeds a parent who could previously decide the sex of its offspring? yet that such is the prerogative of the queen bee is an undoubted fact. The bees are taught by their instinct to supply the hive with every necessary requisite, such as honey, pollen, water and resin. This latter substance is only used to fill up crevices in the hives, or fasten the frames so that they may not move. Water they only carry in just sufficient to supply immediate need, such as to prepare the food for the queen, and the young in their larval state. Of honey, however, whatever more is stored than needed is made use of and at once taken away by "greedy man." But a superabundance of pollen in a hive is a complete nuisance. Whatever is not made use of at once becomes dry in the cells, and is scarcely used at all afterwards, so that when we extract frames out of the lower story we frequently find, in our locality at least, whole frames almost entirely filled with this useless substance. That it is necessary in the hive every careful observer will at once admit, but it appears to me that in our climate, when the bees can no longer get any honey, they take home pollen in loads. This is one main point which has induced me of late to arrive at the conclusion that in our mountainous districts the ten-frame Langstroth hive is too large for the brood room, for if they had less room given them every inch of it would be required for brood rearing, and very little space left to fill with pollen. The same argument

holds good in regard to the drones. A hive would soon become extinct without them, and where the frames are supplied with whole sheets of foundation very few drone cells are raised, but as soon as only a starter is given to a frame, drone-comb is the result in most cases. Now for both of these points, namely, too much pollen and too many drones, Alley's drone trap is an excellent remedy. The drones are very easy despatched, and the workers in making their way through the narrow apertures drop the greater part of the pollen on to the floor of the drone trap. There is another thing which has troubled me for years in beekeeping here in Victoria. It is this:— Sometimes we have fine weather during the month of October, and brood rearing goes on well for some time. All of a sudden there comes a change, cold boisterous weather sets in, and in a few days chilled brood is found outside the hives. But this evil does not befall all hives alike, only those hives which have a large entrance scooped out of the floor barrel in the very centre, so that the cold wind at once has free access to the brood nest. I think there are two methods by which this occurrence might be avoided. One is by having the frames close ended, and the other by having the entrance in the side rather than in the end of the hive.

Whenever we move from one district into another we find that we have many things to learn we did not know before. So it happened to me, although the distance from Hamilton to the Grampians is not very great, yet I very soon found out that I had much to learn. When I arrived here the gentleman who keeps the rain gauges up the Victoria Valley said to me, "The more grass trees you will set on fire the more honey you will get."

This suggestion seemed rather strange to me at first, but I was only here a few months when I was fully convinced that his statement was quite correct.

To save the estate from damages by bush fires, which annually occur in these localities, I had to burn the scrub outside our fence, as also a great number of grass trees, because these contain so much resin that it would be too dangerous to let them remain uncharred. After a few months had elapsed the grass trees shot up flower stalks which were covered with white bloom, smelling very much like the bosswood. This was one important experience which I had thus made; there was more to learn yet. When the gum trees flower the people say there will be honey this year, and so it comes. Now I have ascertained that there are numbers of eucalypti which do not flower annually, and there are others which do, and again others which blossom once in about nine or ten months, but these things cannot be learned when one lives in a town. But here I study trees, beside bees, and I find that some which flowered last year in February and March will bloom again in those very months this season. And, further, I thought when I had raked the ground and burnt up the leaves and rubbish it was done. But I found that the eucalyptus, although belonging to the evergreen trees, sheds its leaves annually as well as de-

ciduous trees, only with this difference, that the new leaflets are there before the old ones drop. While I am writing the grass trees are in bloom, also the Emu berry, three varieties of Epacris, the white, the pink and the scarlet. The native holly is just beginning to flower, the Corea has just left off, but many others whose names are not known to me are fully out, and their beautiful fragrance is an indication that they possess honey. As the holly is in full bloom until long after Christmas, when the messmates begin, there is not a single week during the whole of the year when there are no flowers here.

H. NAVEAU.

July 18, 1889.

Reports from Australian Apiaries

ITALIAN APIARY, GLEN HASTINGS. BULN-BULN.

The past season has been a very good one in this district. The heaviest flow was in February, when the messmate was in flower. I extracted four hundredweight of honey from three hives. I started with four stocks and formed five nuclei that are now fine and strong; three I extracted, and one I worked for comb honey. I reared queens for them from a Kangaroo Island queen I bought from Mr. Chambers. The whole are now fine, strong and healthy. I had foul brood in the spring, but I put the bees into clean hives with starters, scalded the old hives and burnt the comb: this is the surest way of getting rid of the disease. The white gums are now heavily laden with buds which are just breaking; these gums flower all the year round, so I think we shall have a very heavy flow in the summer.

ROBERT HASTINGS.

July 4, 1889.

BLACK RANGES APIARY, NEAR STAWELL.

Number of Colonies. September, 1888, as follows: 37 Pure Italian; 33 Blacks and Hybrids. All strong colonies in splendid condition. Swarming began 27th September, ending the 16th of November: total number of natural swarms, 69; these with a few artificial swarms made during the season brought the total stocks to about 150; upwards of 20 of these were used for queen rearing. The hives were all of the Langstroth form. Began extracting 1st December, and finished on the 16th March. It was my intention to continue extracting during March and part of April, but bad weather put a stop to further operations. The season throughout was a beautiful one, and the total weight of extracted and comb honey secured amounted to 18,417 lbs., all first class. The bees are now taking their winter's rest, with a good supply of sealed honey which they will require to carry them through till January next, for we expect no blossom of any description till the prickly bush blooms in January, followed by honey-suckle in February and spotted box in March, April, and May. We usually have to resort to

feeding every other spring (from October to January). Bees in boxes will suffer in the coming spring if not fed and well cared for, for I am confident one half the bees are lost in this district. That is, they die or desert their hives after being deprived of their comb, through the neglect of their master.

DONALD CAMPBELL.

Black Ranges,
Stawell, July 8. 1889.

STEWART'S RANGE APIARY.

My last report was dated July, 1888, and stated that the bees were busy on the head-flowering gums. This year continued in bloom till December and yielded a large supply of honey. I had brought out here 32 colonies in splendid order, and these increased to 70 by the end of the swarming, which kept in full swing from 21st October to end of November. The reason they were so late starting to swarm was because I started extracting on October 1st and did so every week till end of December, up to which date I had extracted two tons of honey. The reaction set in then, and there was no honey coming in at all. January, February, March, and April were all famine months, and although I fed liberally stocks began to dwindle. I found that in order to get the usual May honey—that of the honeysuckle—I should have to unite. This I did, uniting down to 32 colonies—the original number. I moved all these up into the range right in the midst of the Banksias, but despite my trouble May proved no better than the four preceding months, and I had to cover up the bees warm for the winter. I notice that the bees are working well this month, and as flowers are very abundant next spring may prove better. Last season I got 4 tons from 12 to 32 colonies, this season only 2 tons from 32 to 70 colonies.

F. PRICE,
Proprietor.

Correspondence.

MISLEADING REPORTS.

To the Editor of the Australian Bee-keepers' Journal.

I notice in your last number, page 132, that someone wants cost of setting up a 200-hive farm. The query naturally arises—Why? Surely if he is so inexperienced as not to be able to figure it out for himself, he does not purpose starting one of that capacity; but perhaps he wants to decide a wager, or get at what his own farm should fetch or—but never mind, he'll find it all out in good time. I notice Mr. Dickens says on p. 142 that from 300 to 400 lbs. per hive can be obtained in Victoria. I would much like to know where. I guess I would go there. I have seen three or four reports of the same nature in Victorian papers, and cannot see how they can lead to any good, except to supply dealers, whose object naturally would be to coax people into the business. On the other hand, from what I hear,

people who are already in are anxious to get out again. Two of the fraternity have recently offered me their farms at a low price. In 1887-8 we got a first-rate season—every one had a crop—but there was no market, or rather the market was glutted. Good strained honey was hard to sell at a penny per lb., and extracted only brought two pence. The season just gone there was precious little honey at all, and as there was a very large quantity being held from previous seasons, prices did not rise sufficiently to recompense the producers. My own crop for 1887-8 was seventeen tons extracted and twenty-two thousand sections, probably the largest that has been harvested in Australia; in 1888-9 I got eleven tons extracted honey and no sections—one farm of 200 hives not giving half-a-ton. Suppose that this farm had belonged to a beginner, it would probably have "shut him up." This is not a particularly bright picture, and I am sure that many beekeepers could show a worse one if they felt inclined, so that, as I said before, I do not see any justification for putting such glowing accounts before the public. I have no axe to grind in this matter as I am both a supply and honey dealer myself.

MAJOR SHALLARD.

Blue Mountain Bee Farm.
Glenbrook, N.S.W.

WINTERING AND FEEDING.

As I am just writing, I may as well point out a matter or two which appeared repeatedly in this journal, and may do more harm than good, to the effect that poor stocks should be examined and fed on syrup or candy in winter, &c., if necessary. In not approving of these matters, I do not mean to say that I would let the poor creatures die sooner than examine them in winter, but what I desire is this:—That every beekeeper should make it his rule to leave his stocks such quantity of honey, and prepare them in such conditions in the autumn that they need no examination nor feeding with syrup or candy during their winter's rest. And that they shall not be suffered to swallow a syrup which may cause them stomach ache, while their keeper enjoys at his table their delicious nectar which he robbed from them; let him eat the so well prepared and highly prized syrup or candy himself, he can stand such stuff much better than his bees, and if he suffers as his bees might, it serves him right. Above all: The inexperienced beekeeper, although knowing that his bees had a good store of honey in autumn, reading of the possibility of the bees stores falling short and too anxious for their welfare, proceeds at once to make sure. He disturbs them unnecessarily, the heat escapes, more honey has to be consumed to replace it, and they feel as one does after being disturbed in his night's sleep by a friend asking what time it is. Another again, without ascertaining whether his bees want feeding or not, not for fear of disturbing them, but for fear of being stung, and as anxious for the well-being of his bees as the former, mixes up some stuff, too thin to eat and too thick to drink, and shoves it into the hive, carrying with him the satisfaction that he

has done his best. Such instances as these are facts and others could be cited.

Let us, by all means, abstain from superfluous references to syrup as food for bees, if we cannot afford to throw it overboard altogether, and it is likely as not that some diseases and sufferings of the bees may be prevented. Let our observations be directed to nobler and more profitable studies, the bees life and nature is so full of it and affords ample opportunities. Study them in the hive as a whole body, from the queens to the drones their their use and design. From the egg at bottom of the cell to its hatching out as a perfect insect, ready to do its duty and die. Study them on the comb which you hold in your hand, watch them on their way in and out of the hive. follow them to their watering place, to the field, from flower to flower. Study the flowers, and study their (the bees) nature, their habits, and then say, if this is not a nobler, a more profitable occupation than boiling sugar syrup. Say, if such study does not make beekeeping more pleasant, agreeable, and leads the soul to a sphere hitherto unnoticed to a sphere where it must be admitted, "With our might is nothing done!"

Parramatta, W. ARBRAM,
27/7/89. Manager Italian Bee Co.

AN APIARY FOR ONE HUNDRED STOCKS.

In regard to your correspondent's inquiry *re* information to appliances, building, &c., for an apiary of two hundred hives, I wish to supply some (perhaps useful) information to your correspondent as well as others. My information is the outcome of practical experience, and if I differ in some respects from yours, it may be the means to compare them. and the best should be adopted.

Whether your correspondent desires to make a start with two hundred hives or not is not the question to be decided, nor whether the locality is suitable for the purpose. In regard to the former, I am inclined to believe that he has the knowledge of the management, and intends to make bee culture his occupation for a living, or he intends to engage a person who has the knowledge, and that he has the required capital; in regard to the latter question, if he has not formed an idea by the result of his own, or one of his neighbours who keeps bees, a good look around the district upon the vegetation, and a little enquiry concerning its flowering from his neighbours, will give him the desired information. Large timber is to my opinion no objection for bee culture, as many farmers who keep their bees close to or quite under large trees will testify. First he has it in his hands to prevent swarming to a great extent if he desires no increase, and it makes no difference whether clear of large timber or not; second, he has the means of artificial swarming; and third, he can use the swarming bag, by the proper use of which the swarms have no opportunity offered them to settle on high trees; while on the other hand they give good shelter, shade and flowers. Of course the trees

should not hide the hives beneath their branches altogether.

The first points to consider are the area of land and how the hives shall be placed, whether scattered about the ground with ten feet or more space between each hive, or whether they shall be placed under a shed, and whether the bees may be objectionable to neighbours. In this and the first case a larger area is required, while in the case of a shed being decided upon, about one acre is quite large enough if the shed is erected in the centre of the ground. The cost of land can easily enough be ascertained. After having decided the area of ground and the placing of hives, the spot for workshop and extracting room is to be fixed. I like to have both as close to the hives as possible, so that when engaged in the one or other room, I can oversee the whole apiary when looking through the window. The workshops, whether for making hives or otherwise, ought to be about 20 x 12 feet, be iron roofed, and the sides covered with weatherboards, but no flooring or veiling is necessary. Doors and windows are fixed to suit the purpose. The costs will be from £15 to £25 for material and labour, according to cost of timber, &c. The necessary tools can easily be obtained, as well as their cost. The extracting or honey room might join the workshop, and be of about the same size, or somewhat larger, but must be floored, ceiled and lined with lining boards inside to make it bee-proof, which could not be effected with weatherboards only. Sash-windows will answer best, and when opened a frame 1 x 2 inches may be fixed into the opening; this frame to be covered inside and outside with 1-12th of an inch mesh of galvanized wire-netting to afford ventilation when required. The cost of this room will be so much higher than the workshop, as the flooring, ceiling, lining and extra labour demands. Besides the extracting room I like a honey-store room in the dwelling-house for obvious reasons.

The bee shed is not looked upon as favourably as it deserves, and it is not in use with all beekeepers; but although its erection increases the cost of starting to a certain extent, I would not be without it in this country where the sun has a great power, and where the rains are often very heavy; and whether its usefulness be admitted or not, go where I like I always find some sort of a cover over the hives, or even the common boxes, which certainly indicates that shade and shelter is approved of. Why then not erect a proper shed at once? Of course the hives could not then be spread all over the place, or it would necessitate too many sheds and be too costly; but what hinders one placing the hives close together, say 2 feet apart? The advantages of this are so manifold as to justify it. It is true my hive is more suitable for a shed, as it can be placed in two tiers one above the other, and it affords all the advantages of any other hive; but if another kind of hive be used, is the shade and shelter the shed offers for hives and bees as well as for the operator of no consideration?

Having approved of land and buildings, it remains to ascertain what appliances are neces-

sary. As the hives can be bought as cheap and more accurately made than if made at home, why make them? Moreover, assuming that the bees also can be bought, it is wiser to procure full stockhives at once, in which case two birds are killed with one stone, so to speak. I may here mention that I have supplied more than one party with 25, 50, and more hives. In Europe the course of supplying a hundred or two hundred stocks is often followed, and why not here? Two hundred stocks give one person full employment and a fair interest on his investment, besides his living. As to implements for the management of bees, a couple of smokers, knives, and scraper for cleaning hives and frames, brushes or small brooms for brushing the bees off the combs, frameholder, comb boxes, half-a-dozen or more swarm boxes, one dozen queen cages, a wax extractor or press, a few pounds of comb foundation, and for extracting the honey, one well-approved pattern of four-framed extractor, one small tin dish for uncapping, and a larger tin to put the cappings in, a couple of uncapping knives, a sufficient number of honey cans, one or more large honey tanks with tap at bottom, and a bucket, are all the implements required. Comb-foundation by the hundredweight and sections or mats are not wanted if full stockhives complete are purchased, but a number of empty hives should be in readiness for swarms, for the frames of which a small quantity of foundation for starters is needed. A person who intends to work two hundred hives will hardly want a veil and gloves, well knowing that a cat with spectacles and gloves will catch no mice. Whether a barrow be wanted or not may depend on circumstances.

As to the appliances for queen-rearing, suppose the sale of queens was not the object aimed at, in which case a dozen of queen-rearing hives would quite suffice; but if sale of queens was the object, then a larger number of queen hives are required, and as a person who undertakes to rear queens for sale does not need to be instructed how to proceed in this respect, no more need be said, while an explicit instruction would be insufficient for an amateur; and I think the number of those dabblers who want to sell queens and do not know how to rear them does not want strengthening.

For prices of these goods and further detailed information apply to trustworthy and reliable beekeepers, who make it their business to supply all these goods, and bear in mind that the cheapest article is not the best.

It may be as well to refer to the race of bees most profitable. In this respect I can state without fear of contradiction that the Italian bees, although they are higher in price than the black bees, deserve the preference. They soon repay the extra outlay, and they have the most good qualities combined.

Almost the same appliances for making or manipulating one hive are required as for one hundred or two, hence the larger the number of stocks the less outlay proportionately, and the greater the profit.

W. ARBRAM,

Manager Italian Bee Company.

Parramatta, N.S.W.,

July 27, 1889.

Extracts.

SPRING.

THE MANAGEMENT OF BEES IN THE SPRING.

Read at the Erie Co. Farmers' Institute

BY O. L. HERSHISER.

At no season of the year do bees need more careful management than during the first warm days of spring, and until they can gather honey from the fields. Losses are not usually heavy during the winter months; but from the latter part of August until fruit trees bloom, the fatality is sometimes great. It is not a difficult matter to winter bees; but to "spring" them successfully often requires much thoughtful attention to their needs and condition.

The first requisite is plenty of food. If this matter has not been looked to in the preceding autumn, preparatory to wintering, it should be on the first warm day of spring. Springs following years of failure of the honey crop, and especially failure of fall honey, are usually springs of heavy losses from starvation and dwindling. If each colony is provided with from 25 to 35 pounds of stores in the fall, they will in nearly every case have abundance to last until the flowers produce honey again.

A normal colony of bees will consume from 6 to 12 pounds of food from fall till Spring, and from this time till fruit trees bloom about as much more. If they consume more than this they are not in a normal condition, and are liable to perish. The less honey a colony consumes during the winter, the better will be its condition during the spring.

FEEDING BEES IN THE SPRING.

If bees are out of food, empty combs in the hive should be replaced by combs containing honey. If these are not accessible syrup made from the best quality of granulated sugar may be fed. In feeding, be careful to allow as little loss of heat from the hive as possible. A strong colony will store several pounds of food a day.

A bee-feeder is desirable in feeding syrup. Some beekeepers prefer to feed by replacing empty combs in the hive by combs containing sugar syrup. The combs are filled by laying them on a board and pouring the syrup into the cells with a dipper. They should be hung in the natural position and allowed to drip before placing in the hive. Feeding should always be done in the evening to guard against robbing.

If it is desirable to stimulate bees to rapid brood-rearing, a small amount should be fed daily, and the feeding prolonged till the flowers yield honey. If bees have plenty of capped stores, brood-rearing can be greatly augmented by uncapping a part of the honey and placing it back of a division-board. As often as the bees restore the honey the operation may be repeated, until the bees can gather honey from the flowers.

CLEANSING THE HIVES.

If many bees have died in the hive during the winter, they should be removed; this is easily accomplished if hives have loose bottom-boards. Get an extra bottom-board and exchange it for the bottom-board of the next hive, and so on. As nearly all the dead bees have fallen to the bottom-board, by scraping the latter you have pretty thoroughly cleansed the hive. This operation offers very slight disturbance to the bees, and it is but a moment's work to lift the hives and exchange bottom-boards.

If the hives have tight bottom-boards, or are in packing-cases, a part of the combs containing the fewest bees should be lifted out, and this portion of the hive cleansed; then move the remaining combs and bees to the clean side of the hive, and finish removing the dead bees, after which the combs first removed may be replaced.

If the hives are of the same pattern and look alike, so that a change of hives will not confuse the bees, they may be cleansed by transferring the first colony into a clean hive, by simply lifting the comb and bees into the latter, and placing it in the position of the first hive; then scrape the hive just emptied, and transfer the next colony into it, and so on.

It is not always necessary to go through the operation of cleaning all the hives. If there are a few dead bees, the better plan is to allow each colony to clean its own hive. In the spring following a mild winter, during which the bees have had frequent flights, the hives will seldom contain many dead bees.

When there is an abundant crop of late fall honey, some colonies will store so much in the brood-chamber as to leave insufficient room for brood-rearing. Colonies left in this condition cannot increase rapidly in numerical strength. If the hive is overburdened with honey, some of the full combs should be exchanged for empty ones. Then by uncapping some of the remaining full combs, the honey will be rapidly transformed into brood. Uncapping the honey seems to create the impression among the bees that there is great demand for labour, and they consequently rear young bees as rapidly as possible to meet this apparent need. Thus these otherwise superfluous stores can be converted into full and strong colonies to gather the white clover and linden harvests when they come.

The matter of reducing the stores to the proper amount should be looked to in the fall, and all honey, not needed for wintering, extracted. No more than 30 pounds of honey per colony should be left for wintering.

QUEENLESS COLONIES.

Very often colonies become queenless during the winter. As a rule it is poor economy to purchase queens early in the spring to re-queen them. If the colony is strong it may pay to re-queen. Queens in April are quite valuable, and usually cost as much as an ordinary queenless colony is worth. If the queenless colony is strong, the better way would be to unite it with

the weakest colony that has a good queen. The queen begins laying from the middle to the last of February, and the entire absence of eggs or larvae in a colony after the middle of March or first of April is sufficient evidence that they are queenless, or that the queen is worthless.

Queenless colonies are liable to be robbed by other bees during the first warm days of spring. The bees seem to lose courage by the loss of their queen, and submit to the robbers with little resistance. Robbing can be easily detected by the great number of bees flying to and fro from the hive that is being robbed, and by the fine bits of honey-comb and rubbish about the entrance of the latter.

ROBBING—UNITING COLONIES.

When it is found that a colony is being robbed, the entrance to the hive should be closed for 10 or 15 minutes, to allow the robbers to secure their load of honey, and then opened to allow them to fly away with it. The robber bees that have collected to enter the hive, may be kept away with smoke, while the robbers that have been confined are leaving. After the robbers are out, the entrance should be closed until evening, and then, if queenless, the bees united with another colony.

In uniting, reduce the number of combs in the colony with which you wish to unite the robbed colony, and remove the remaining combs and bees to one side of the hive, and confine them there with the division-board. Place the robbed bees in the remaining space in the hive on two or three combs containing sufficient honey to last them two or three days. All means of passage between the two divisions of the hive should be closed for two or three days, and during this time the robbed bees should not be allowed to fly.

After this confinement they will go together with little or no fighting, and very few bees will be lost by trying to find their old home. They may be brought together by lifting out the division-board and properly arranging the combs. They can also be united by drumming both colonies for ten minutes, keeping the entrance closed; this frightens them, and they fill themselves with honey, when they lose all disposition to fight. This is probably the better way, if the hives are alike, and the two colonies to be united are side by side. But if unlike, and some distance apart, the former method is the best.

Each colony should be confined in space according to its numerical strength. Remove empty combs and use a division-board to confine the bees to the proper space. They should have no more combs than they can cover in moderate spring weather.

In handling bees at this season of the year, care should be exercised that they do not "ball" and kill the queen. "Balling" the queen is a very singular and annoying peculiarity; the bees seem to blame the queen for any disturbance in the home, and often try to kill her when the hive is opened for manipulation. If you notice a little ball of bees about an inch or less in

diameter, tightly clustered, you may be sure the queen is in the centre of it, and in danger of being stung or smothered. Get the bees away from the queen as soon as possible, by smoking or throwing the "ball" into water. When the queen is secured, she should be caged in the colony for 48 hours, when she may be safely liberated.

Bees should be manipulated as little as possible. Sufficient fruit to last until fruit-trees bloom in the spring should be provided in the fall, so that no manipulation of the hive will be necessary until settled warm weather in the spring.

Bees will generally take care of themselves in the winter, if well prepared in the preceding autumn; but a few hours attention in the spring is well spent time, and may result in saving good colonies from starvation and dwindling, so that a few weeks later they will yield a handsome profit.

Big Tree Corners, N.Y.—*Am. Bee Journal*.

THE LANGUAGE OF BEES.

Paper by Mr. Grimshaw, read before the British Beekeepers' Association, London, May 22, 1889.

In the first place, the use of the word 'language' is, to my mind, faulty as applied to insects, or, indeed, to any other animal excepting man; but as I fail to find another word expressing exactly what I do mean, I will ask you to apply it only in the sense of a method of expressing ideas. I take the word 'language' to convey the notion that a tongue and vocal organs are first necessary for the utterance of signs and sounds previously arranged by art into an orderly system, the comprehension of the meaning of these sounds being possible only to such individuals as have been taught their meaning in the past. In other words, I cannot think of bees, nor of any other animal besides man, as possessing a language in the true and full sense of the word. The arrangement and development of a real language is as much an artificial process as the invention of either an arithmetic or a system of mathematics; indeed, as much so as is the art of writing or telegraphy. It is only by some such use of his intellectual power that man proves his right to be classed as a superior being, endowed with something (reason, mind, soul) which lifts him far above the rest of animated nature.

We have no direct information as to the language used by our reputed first ancestors, but I opine they conversed mostly by dumb show, incoherent exclamations, and facial expressions of varying emotions; that as these signs began to be mutually understood, they formed the nucleus, and became the foundation, of a language. I could no more believe man was

created having a ready-made language intuitively than I could believe him provided by nature with a Waterbury watch. Every tongue spoken by every race of living men, the unused languages of extinct peoples, who still live in their written records as much as the minds of the early writers vivify the ancient classes, all show themselves to be truly structural and orderly works of art (built up piecemeal on their foundations), as is the Acropolis of Athens or the Eiffel Tower. This cannot be the case with the methods of intercommunication used by bees. We must as much deny them the knowledge of a true language as we deny it to the infant, who has no royal road to its speech; it has all to learn by hard experience from its first imitative utterance up to the fine period or the orator; from the alphabet forwards, and backwards to its cuneiform decipherings.

Let us mentally enter the bee-hive in search of the method by which our bees communicate ideas, impressions, desires, one to another. We may not be able to get much information beyond that already at our disposal in past writings, but perhaps we may dispel one or two false articles of faith which simply obtain until they are brought into the daylight of reason. Animals devoid of the gift of acquiring a language are compensated for this loss by an immense endowment of instinct, an intuitive and most electrical power of comprehension, an unreasoning, urging impulse, by means of which they are enabled to understand one another. In this way the broody hen utters her clucking long ere she hatches her chicks, and when a bird flies across the sky, hereditary alarm and solicitude for its young instinctively suggest to the mother the soaring of a hawk. Then follows the warning maternal shriek, and the instinctive rush of her young ones to the shelter of her wings. Similar instances are plentiful in natural history, but they only convey to us an idea of the existence amongst animals of such a rude method of communicating ideas as is instanced by the effect on human beings of smiles or tears, laughter or crying, by the expression of the face, movements of the limbs, or by such dumb show and voice-tones as might be used by savages of different races in their attempts to intercommunicate. Such a low form of language as this is lofty as compared with that of our bees, for to utter and comprehend it demands the use of reason. Nothing perhaps, besides mechanical instinct, and irrational acquiescence in, and obedience to, the habits of the multitude, prompts or guides the bee in its wonderful operations in the hive. Such promptings may be illustrated by the marshalling of a swarm of tadpoles in a stagnant pool, the orderly movement of a school of fish in the sea, or the regular deploying of an immense flight of birds in the air; mysterious affairs, but not more so than the swarming of bees was considered a short time ago, or the movements of a cluster in wintering 'one cell higher' at a supposed given signal, the said signal simply being the advance of a top row of bees after having emptied the underlying cell, the underlying bees' heads following those above them for warmth's sake.

I am not intending to deny to the bee the possession and use of some power very closely resembling reason, but I am endeavouring to show that amongst many of the wonders written down to its credit, that of the use of a power we call language does not exist.

We commonly suppose that if, in its morning's wanderings, a worker comes across a find in the shape of a lime-tree, a clover field in an adverse wind, or even an ill-guarded hive, she rushes home, communicates her discovery, and is followed away by a numerous company. Not a bit of it; I think she greedily gorges, like a glutton, on semi-intoxicating nectar, until she can only just land home (or into some one else's home), and is met on the threshold by one or two affectionate janitors who welcome everybody possessing anything to their taste, and proceed to relieve the incomer of its surplus wealth, whilst we poetically imagine a lively conversation is being carried on by means of the antennæ as to the whereabouts of this new El Dorado. No, they themselves probably determine to follow in the wake of the nectar-scented bee when she quietly sneaks out for another load, the surplus of which she has hidden away in a cell. Like Sin, her guilt leaves behind it a betraying trail, and when the outward journey is taken, without the necessity for a single word, divers members of the family circle, aye, and neighbours too, accompany her like wreckers on the coast. Believe me, the wise provision (provision) for winter which alone asserts the superiority of the honey-bee over most other insects, will, in time have to be consigned to that limbo of romantic and poetical myths with which an inventive and fanciful ancestry has surrounded our science. Selfish greed leads them to gather much more than they require for the time being; so it is build and store, store and build, as long as the honey glut lasts, under the wise guidance of the same Almighty hand which sends the grub downwards as the frost intensifies, and draws the sap upwards in return of spring. Therein is the wisdom and wondrous mystery, not in the will of the creature, but in the omnipresent power of the Creator.

Admitting that bees have the means of uttering, and the power of hearing and interpreting certain sounds made by others of their kind, this is probably as unreasoning a sort of language as that of the dog baying the moon or howling at the sound of music. The instinctive piping of of the queen always means the same thing; the agitated, irritated worker puffing out of the spiracles its currents of air impinging on the rapidly moving wing-edges tells us thus of its anger: the steady, business-like regularity, the happy hum of the worker working, tell its mates that if they are to do much work they must not make much noise about it (especially is this the case at early morn and dewy eve, when the wing-edges are moister than in the full heat of noon-time, at which time the noise of humming sounds sharper and louder than at others): the music of swarming, the tones of flying drones so exciting to the bee-keeper who hurries forward preparation for swarms, these are mechanical notes which

only accompany various phases. What others there may be is a matter of conjecture, and they can only be admitted to exist by analogy.

Let us now turn to that enchanter's wand, the antenna, wherein, to my mind, resides more of wonder, more of mystery and beauty, than in any other part of the bee's body. We must admit that highly developed touching, smelling, and hearing organs all find their place on this flail-like rod, but I doubt very much that the bee converses by its means; indeed, I will be venturesome enough to deny it altogether. My reason for this heresy is, that for the bee to use its antennæ as the medium of language, tapping on the head of its companion (over that part known as the œsophageal ganglion), demands the existence of a code of signals understood by both, and codes (unlike poets) are made, not born. A code demands not only a rational intellect to invent and prefect it into a system, but an assistant language for its elucidation and explanation. Semaphores, or the Morse method, necessitate that other wonder of the world—a written language. For a newly hatched bee to receive a series of taps on the head according to an organized system requires first that it should be master of such an arrangement before it can comprehend it, and it would call on us for as great a stretch of imagination to believe the young bee capable of understanding a language of code signals as to believe an infant capable of telegraphing round the globe in its mother (!) tongue. We have probably slipped gradually into this great gulph of error in noticing the movements of the antennæ: we have perhaps mistaken mere olfactory courtesies, when bee meets bee, for gossiping inquiries, whereas we might be nearer the mark if we put such movements down to a morbid inquisitiveness after what 'isn't his'n'.

I believe the greatest difficulty in the way of the student of bee-physiology at this day is the vast amount of error imbibed in his early lessons, and this has to be unlearned before he can see the beautiful simple truth. Veils of allegorical fiction about kings, queens, and so on, have been woven from time to time, until now, covered with the dust of antiquity, they appear as disgusting festoons of cobweb, hiding much that is beautiful and true, amongst which I fear we must class the common belief as to their talking to each other by the antennæ. As an instance of error to unlearn, let me call to your mind the assertion of Butler's, that just before the issue of a swarm 'the candidate for the new throne is then with earnest entreaties, lamentations and groans, supplicating the queen-mother of the hive to grant her permission to lead the intended colony. This is continued for two days, when the old queen reluctantly gives her fiat in a fuller and stronger tone.' What nonsense! Surely there should be nothing left in the hive for us to learn when the ancients found out, or rather imagined, so much about them, and their pretty conceits have, in course of time, come to be accepted as matters of wonderful fact! The famous experiment of Huber really is in support of the theory that bees do not converse by means of the

antennæ, the small hollows on them evidently being of necessity passed over parts of other bees before recognition is completed. If you remember, in his experiment the queen had to personally answer every inquiry, whereas, if they used a language, or code of signals, the information would have been passed on from one to another. If bees had such a correct method of exchanging ideas as we are led to suppose, we should have little trouble in queen introduction, and only have such a number of queen and drone-cells as might be required. The supposed signal to swarm seems to be only an unbearable tumult, which reaches such a pitch that the bees begin a stampede; the supposed signal to kill drones is perhaps contagious, the result of jealous greed, stores cease coming in, and a dog-in-the-manger policy gets abroad; the supposed signal to ventilate may be but an individual effort to get rid of individually surrounding foul air. For bees, in my district at least, do *not* invariably fan at the porch and on the floor of the hive, with their heads pointed so accurately that a current of fresh air is increasingly forced in, and vitiated air being expelled over their backs. Again, it is open to serious doubt whether the bees *do* use their antennæ as compasses, callipers, or measuring instruments, in any way. I will admit their power of hearing, smelling, and touching, but not that they have in them a means of conveying ideas as a language. A blind man is noticed to tap and touch with his fingers-ends objects he requires to identify, and in extremely delicate cases he has to apply the finer touch of the lips and tongue to the object. How wrong, then, we should be if we were to say he was signalling with his fingers, or tasting with his tongue.

In a paper previously read by me on 'The Vocal Organs of Bees,' I endeavoured to draw greater attention to the vocal apparatus corresponding to the hearing hollows on the antennæ. In my observations to-night I desire to lessen the importance attached to the antennæ as tactile conversing media. I am willing to admit the possession by bees of a beautiful system of inter-communication, by voice and hearing, the sounds of the voice being as much used and comprehended by them as is the case with any animal in creation, excepting man, who by art has arranged his voice tones into a language. At some future period we may be able to record more bee-tones than to-day, but to comprehend them we should require what there is little chance of acquiring, *i.e.* the keen intuition possessed by many of the brute creation.

I feel some diffidence, and must apologise to you for placing my opinions in some contradictory shape to those held and enlarged upon by certain authorities on the study of insects. My excuse must be that in bee-keeping some of the greatest lights have propagated the greatest errors; it therefore remains for the careful and candid to prove all things for himself as far as possible. In such a search even *his* glimmering lamp may shed a ray in a dark place, and in laying his crude opinions before his fraternity thus draw attention to points of interesting future exploration.—*British Bee Journal*.

MODERN BEE KEEPING.

A HANDBOOK FOR COTTAGERS.

(Continued from Page 118.)

V.—NATURAL SWARMING.

As the spring advances, and food begins to be carried into the hive in abundance, the queen deposits eggs in daily increasing numbers, and soon the population so grows as to make it desirable for the bees to break up into two communities, or, in other words, to swarm. Usually, but by no means invariably, as much as seven or eight days before the swarm leaves, the bees make preparation for it by beginning to raise new queens, as described under the head "Natural History of Bees." When the queen-grubs have been sufficiently fed they are sealed over, and then the swarm prepares to depart, if time and weather are favourable. The bees gorge themselves to their utmost, and then pour out by the hive-door in a constant stream, and circling round in the air fill it with their merry hum. Generally they quickly settle, gathering together in a cluster, which may be seen to rapidly grow as loiterers join it. As soon as they have fairly taken up their quarters we may proceed to hive them.

If the branch of a tree or bush has been selected, lay a cloth or sack on the ground as close under it as possible, and the skep should be he'd, bottom upwards, beneath the swarm, while the part of the branch immediately above is smartly shaken, when the bees, holding on to each other, will fall in a mass. The skep should now be very gently turned over and placed upon the cloth with a bit of wood or stone under its edge, so as to let the bees run under the hive. We must always secure as many bees as possible in order to increase our chance of getting in the queen. If we have succeeded in this, the bees within will soon suspend themselves from the roof, while the remainder, discovering that the mother is gone, will scatter in search of her and join those in the skep, which may then be placed in its permanent position. The few bees that do not find the queen will return to the parent stock.

If we fail in getting the queen, the bees, even after entering the new hive, will become quickly restless, soon desert, and return to the cluster, when the operation will have to be repeated.

The hiving can often be made easy if the branch on which the swarm has gathered can be spared; let it then be cut off so gently that the bees do not know of the operation. The hive should previously have been placed at hand on some large board or spread sheet, and propped up in front, so that there may be abundant room by which the crowd may pass in. The separated limb with its living load is brought to the hive, when a sharp shake drops every bee at the door of it; they do not take wing, but their momentary surprise is followed by a cheerful hum, and all face towards and commence to enter their new home. When frame-hives are used it is best to hive into skeps

first or a clean metal pail. A cloth, or sheet, must then be spread on the ground, over the front of the floor-board, and on this place the frame-hive, raising the front off its floor-board by means of a stone or wedge. As soon as the bees are hived in the skep, with a smart jerk throw them on the sheet in front of the frame-hive, which they will speedily enter. Where a metal pail is used it will only become necessary to pour them out gently on the sheet in front of the hive.

The hive must then be placed on the stand which it is intended to occupy. This rule should be invariably adhered to, and when space admits of it hives should be placed six feet apart, and in any case they should not be nearer together than three feet.

If bees chose awkward places for settling, our ingenuity may be tried. Sometimes it is best to use a goosewing to brush them into the skep, while often we may secure them by fixing the hive over them and driving them towards it by smoke. We shall find here, generally, as in many other things, that persuasion is better than force, and a little piece of honey-comb, or better still, comb containing honey and brood, skewered into the skep, will make it so attractive that they will find their way into it.

Do not in any case wash the hive with anything: sugar, beer, treacle, are all alike—worse than useless.

Always remember that bees at swarming-time are excited and heated; if, therefore, the receiving-hive must be left in the sun, it should be shaded by an umbrella, or have a wet towel put over it.

If a swarm has settled, and no one is at hand capable of hiving it, careful shading, or an artificial shower of rain from a very fine rose watering-pot, will usually induce the bees to remain until the operation can be performed. If bees are to be taken to a distance to be put into the permanent hive, it should be done as soon as possible, the swarm being secured in the skep by a cheese-cloth.

VI.—AFTER-SWARMS OR CASTS.

From what has already been said (last chapter) it will be seen that the swarm goes off usually about the time the queen-grubs are being sealed over. Eight days after this the most advanced of these hatches out, and her first impulse is to destroy all the other queens yet in their cells. In this she is assisted by the workers, unless they have determined to send out a second swarm, or cast. Then, instead of the unhatched queens being destroyed, the workers keep guard over them, and the hatched queen will go off with as many bees as choose to follow. Often two, and sometimes as many as seven or eight queens, which have left their cells about the same time, will go with one cast of bees. If these be hived, however, all the queens will be destroyed save one.

Casts should not be encouraged, as through them the old stock may be so weakened as to become useless; and the casts themselves, unless

fed, are seldom strong enough to be profitable, although, if they winter safely, as their queen is young, they do well in the following spring. Casts may be prevented by cutting out all queen cells, save one, after the swarm leaves. If this is done, much care must be exercised, as empty queen-cells occasionally have their lids closed, so as to appear to contain unhatched queens, while now and then they fail to hatch at all. Only hives with moveable combs admit of such an examination as to make this method of preventing casting certain or easy to attempt.

VII.—DRIVING.

Driving is the art of compelling bees to leave their hive at the will of their master; and this operation is often necessary with box hives, both to make artificial swarms and to clear the full honey-combs of bees when we wish to take the honey. A box of about the same size across as the one to be driven, and some sort of table on which to work, will be all that is necessary. The hive to be driven should be removed from its stand to some quiet spot, and an empty box put in its place. Blow into the hive a little smoke, which will send most of the bees to their honey to fill themselves; and if, before giving a second puff, we rap the hive three or four times, it will add to their fright and make the operation all the easier. Immediately after the second puff, lift the hive, and turning it upside down, place it upon the table, putting the empty hive over it, and bringing the edges of them together at the point towards which the combs run. The box can be either propped up so as to see the bees running up, or kept close, the former is to be preferred. The bees being both frightened and filled with honey, are disinclined to sting. Stand with your back towards the strongest light and keep the opening between the boxes before you, so that you may easily see all that passes. Without delay, commence rapping on the side of the inverted box, the open hands being better than sticks for this purpose. The blows must be smart enough to jar the combs, but not sufficiently heavy to risk breaking them from their attachments, and they must be continuous (if they cease the bees will again descend among the combs), and may follow one another at the rate steps are made in moderate walking.

Daylight, the overturning of the hive, and the incessant agitation of the whole, put the bees into great commotion. After a few raps, some of them will appear inclined to proceed into the hive above. A strong, hissing buzz will generally, within a minute or two, announce that a start is about to made, and now the crowd will run up. Sharp watch, while the beating is continued, should be kept for the queen, and after some experience she would rarely pass without being noticed.

The most effective side to administer the blows is that towards which you wish the bees to advance; but it is not advisable to apply the rapping too near the rim, as this tends to shake the bees down again after they have clambered

to the top. Should they cluster together and refuse to move from any particular part, a puff of smoke will at once set them running, or they may be helped forward with a feather or the finger.

In chilly weather, or when honey is scarce, bees will be driven much more easily, if, after administering the first puff of smoke, we lift the hive and pour over their combs about a gill of warm, thin spruce, afterwards allowing them a quarter of an hour for licking it up. The excitement raises the temperature and puts them into first-rate order for the operation.

Driving is inexpedient in the case of swarms, as their combs would be broken by the necessary flows, but it may be done when necessary if the combs be secured a few days previously by one or more skewers thrust through the sides of the hive right across the combs.

The kind of driving above described is called 'open driving.' But the timid may prefer another method, known as 'close driving,' which, however, is not recommended, as the presence and safety of the queen cannot be verified in her passage from one skep to the other. In this, the hive is treated and inverted as before; but the upper box is so placed that the rims of both meet and correspond, while round the two a jack-towel, or strip of calico, is fastened to prevent the escape of any bees. The beating, as before, sends the bees above. The towel is removed and the stock and swarm treated as may be desired.

BEE FLOWERS.

In a fruit colony there will be plenty of blossom in the spring-time for bees to feed from. But blossom is needed by the bees through summer and autumn as well as spring. Nature's provision for them is infinitely larger and is not confined to blossom. Many a time have I seen crowds of them round the rotting windfalls of a pear tree. But their staple nourishment is blossom nectar, and apart from the wild plants there are a few that can be grown near to their hives, which it may not be amiss to mention.

Baron von Müller enumerated 66 different trees and plants suitable for bee food. But to most people it is an alphabetical list of Latin names of trees. In addition to the apple, almond, cherry, pear, plum, apricot, peach, there are *Grevillea Robusta*, the gums, the willows, the hickories, American tulip tree, North American ebony tree, *Wistaria*, *Magnolias*, *Locust Acacia*. On account of its earliness and profusion of blossom, the cherry plum is particularly valuable. Of minor plants and cereals, the following may be mentioned:—*Fuller's Teazle*, *Lentils*, *Ivy*, *Buckwheat*, *Sunflower*, and all peas, beans, clovers, thyme, sage, balm, rosemary, blackberry, dandelion, horehound, marjoram, catmint, American horse-mint, honeysuckle, banana, *melianthus major*, *protea mellifera*. An horticultural friend of mine used to have a large bed of *Echium*

Candicans (*Vipers Bugloss* or *Catapan*) in front of his hives. The long blue spikes of this plant keep blooming for weeks. With the food at their doors, the hives were well and soon filled. *Wormwood* is to be avoided where they are kept.—JAMES MATTHEW. *Mildura Cultivator*.

USEFUL ADVICE.

A strict account of income and expenditure should be kept by every beekeeper.

The beekeeper should think more than once before he makes large purchases of expensive hives and appliances.

Every novice should begin with cheap hives and such necessary appliances only as his common sense tells him are suitable,

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Every beekeeper should have his bees ready to take advantage of the honey season. It is then supers and section boxes are to be filled.

Wise management in the autumn has much to do with the success of spring. The hives must be strong and food plentiful.

The quieter bees are kept during winter the better it is for them. When moving them be careful not to jolt the hive.

If bees are robbed just when winter is coming in, they will have to be fed or they will die.

In feeding bees never give a large quantity at once. It will do more harm than good.

Always have the ground near the hive clean; should a bee then fall fatigued by flight it may rise again.

Let all weeds near a bee stand be turned under with a spade.

If at all timid, put on a veil and gloves, and administer a few puffs of smoke to each stock some five or ten minutes before interfering with them.

Have all stands for beehives moderately low, for as a rule, the old bee stands are too high.

All hives should be placed where they will have partial shade from the oft overpowering heat of the sun.

The distance from hive to hive should not be less than three feet. They will be better still (if there is room) six feet apart.—*Mildura Cultivator*.

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Editorial.

BEE GOSSIP.

Our hints for the season have now come around again to the commencement of a new bee campaign, and as the hints and directions given for each month can scarcely be varied much, we propose to devote our first columns to "Bee Gossip," under which comprehensive head we can put any news, fresh information, or criticisms we think may be interesting to our readers.

FOUL BROOD.

Another method of treatment of this plague to beekeepers is now likely to be added to the hundred and one plans recommended for its cure. The new scheme is vaporizing with formic acid, by putting a shallow dish of the acid on the floor-board under the frames, and covering it with wire gauze, so that the bees cannot get access to it. It is stated that the vapour is not disliked by the bees, and that in 20 days the disease has been quite cured in every case that has been tried. This is the statement given in the *British Bee Journal* of July 25, and if it turns out as stated, it will be an easy method of curing without destroying combs or healthy brood. The exact process is not yet given very clearly; but it appears that in order to get the shallow vessel under the frames extra space has to be made between the floor-board and the bottoms of the frames, by either raising the frames on the runners, or inserting a half-inch slip between bottom board and body. Mention is made of disengaging the vapour of the formic acid more rapidly in bad cases, by dropping pieces of zinc into the acid from

time to time. If we are so unfortunate as to be visited by the troublesome disorder this season, we intend giving it a fair trial, although our ordinary and simple method of putting the bees into a new hive and keeping them comb-building for a while, has been very successful, and as far as our experience goes, leaves nothing to be desired.

CARNIOLAN QUEENS.

A nice parcel of these were sent out to Australia by Mr. Benton per the *Lusitania*, which arrived in Melbourne on the 31st August. Some of these were for ourselves, and others for Dr. Clarke, of St. Leonards, Sydney. About a week before the vessel arrived in Melbourne the chief officer, who had kindly taken charge of them and placed them for safety in the wine-room, found the boxes had been eaten by rats and most of the queens and bees had escaped. All that could be found were gathered together and replaced in the boxes, but died most likely because the rats had eaten all the food in the boxes before leaving them. It is possible one or two queens of the Sydney portion may arrive alive, but the Melbourne contingent is defunct.

FEEDING.

We are glad to see our friend Mr. W. Abram again contributing to our columns, and advocating both his methods of management and the Berlepsch hive, and there is no doubt a considerable force in his arguments. There is much to be said in favor of the Berlepsch hive; its capacity is just right for the particular mode of management, and there are many points which we have found advantageous, but surrounded as our apiary is with a great variety of pines, the propolis

nuisance became so bad that it was a matter of impossibility to move the frames except by literally tearing them out piece meal, and in one instance we took a full pound weight of propolis out of the brood chamber. Langstroth hives were nearly as bad, but we could get at our frames in this case with a lever.

Our friend is hard upon *syrup feeding*, which is so much used in England and America by most of our large beekeepers, and we think his objections are not altogether reasonable. We quite agree that if honey is available, and *certainly free from all suspicion of foul brood poison*, it is better than syrup for bees, at all events, bees like it better; but in the present days, when bees are kept for profit, and honey can be sold at 6d. per pound, while good syrup can be made for 2d., it will take a good deal of persuasion to induce a thrifty beekeeper to give the honey when feeding is necessary, especially when it is shown by long practice that bees will thrive, build comb and breed as well on properly made syrup as on honey. Of course, if, as Mr. Abram says in his facetious way, the beekeeper mixes up some "stuff too thin to eat, or too thick to drink," it would be objectionable; but many of even German beekeepers now feed on artificial foods, as flour-cake or candy, which is certainly "*too thick to drink*." However, it does not do to dogmatize in beekeeping. Some find their bees do best on honey; others say they do as well on properly prepared syrup, and probably both are right. For our own part, we always give frames of honeycomb when we have them to spare; but we would as soon think of giving them arsenic as bought honey, the origin of which we know nothing. Feeding bees on syrup to keep them alive and strong, does not mean feeding them on syrup for giving surplus.

MODERN BEE KEEPING.

With regard to our articles under this head, which are a reprint from the well-known "Handbook for Cottagers," published by the British Beekeepers' Association, we wish to call attention to the fact that for want of illustrations we are compelled in a few instances to depart slightly from the original text. We wish to point out also that where the word "*skep*" is used, the advice will equally to apply to our "*box*" or gin-case hives, for we believe very few "*skeps*" or straw hives are used in Australia. Our readers must also bear in mind that where the particular names of months are given, they refer to an opposite season to that belonging to the same month in Australia. For instance; our

midsummer months are December and January, while in England they are June and July. Our swarming time commences generally in September, but in England it is in June.

Original Contributions.

FERTILITY OF QUEENS.

FACTS AND FIGURES.

CONCLUSIONS TO BE DRAWN THEREFROM.

Perhaps few, if any, of the readers of this journal have ever tried or thought of trying to find out to almost exact figures the number of eggs a queen is laying or able to lay within a certain time. The statement, that it is about 2,000 per day is so vain and insignificant, it is as wrong as right, as misleading as in fact. A correct answer can only be given by taking the circumstances into consideration, as circumstances alone direct the queen to lay more than a thousand eggs a day at one time, less at another, and none at all at yet another. What, then, is the number of eggs a queen may lay under favorable circumstances within 24 hours? What may cause an increase, what a decrease, or its ceasing altogether?

Before entering into an explanation on the above questions, it is necessary to prove what number of bees is justly to be considered for a colony most profitable to its owner. We find the number by weighing them and counting, which weighing, of course, is not quite satisfactory and exact on account of the bees having more or less honey in their body, the weight of which cannot exactly be ascertained. I found them varying from 4,500 to 5,000 to the pound, and this will prove pretty near the mark. Taking 5,000 bees to the pound, a swarm of 40,000 bees would weigh 8 pounds. I have weighed many swarms and found the majority to weigh from 5 to 7 pounds, and these have usually done the most satisfactory work afterwards; I have also had swarms of 10 and 10½ pounds, but they did not do double the work of a swarm of 5 pounds; I have also sometimes swarms united and made them even stronger than the strongest single swarm, and their result proved the same. They did not prove this course to be the most profitable one, and the original number of bees was not kept up. I therefore had to come to the conclusion that a swarm of 5 to 7 pounds was the most profitable, and also that the fertility of those queens can be taken as standard. More extensive trials in that direction have been made by Mr. Hannemann, near Rio de Janeiro, Brazil.

who constructed immense hives, each of several compartments, and these connected one with another. He, living in an excellent locality for bees, got hundreds of swarms in a day, and finding it impossible to procure ordinary hives for them, was almost forced to the step he took, and he placed from 50 to 70 swarms, with a queen in each compartment, in each hive. But, although his millions of bees in one hive have gathered thousands of pounds of honey within a short time, they showed at the end of the season no more bees than ordinary stocks, and their honey yield did in no way equalise that of the same number of swarms in separate hives. These were conclusive proofs and affirm my assertion, that the fertility of the queen can only reach a certain extent; when that extent is reached it must of necessity go down again. The queen either dies from exhaustion, or she is found wanting and consequently done away with by the bees. Other beemasters of authority confirm the same, and it must be recognised as an established fact, no matter what we do or how much room we may provide to each colony; they can't go on increasing and increasing for ever.

Having satisfied myself that the swarms of 5 to 7 pounds, which is about equal to 25,000 to 35,000 bees, occur most usually and are the most profitable, I come now to the explanation as to how many eggs most queens lay daily during the height of the breeding season under ordinary favourable circumstances. To arrive at this, it is further necessary to know how long the bees live in the busy time. This is easily proved with the aid of the different colored races of bees, and I find, that although some bees live at least three months in the summer, and of course much longer in winter their average is about six weeks to two months. Taking this for granted and also that about the same number of bees remain behind in the old hive, out of which a swarm issued of five or seven pounds or 25,000 to 35,000 bees, then there must have been from 50,000 to 70,000 bees in that hive before it swarmed, and the queen must have laid 50,000 to 70,000 eggs within say 40 days, or 1250 to 1750 per day. The highest point of breeding seems to be reached about 14 days before the swarms issue—as can be ascertained by examination of the combs after the departure of the swarm, when most brood cells will be found sealed—consequently the highest number of eggs laid for a short time is about 2000 per day. This does not mean that her average laying during the whole season was 2000 every day. Not at all. Let me illustrate it.

Assuming there are 10,000, or 2 pounds of bees in the hive on August 10th, when the

queen commences laying, these bees might well be expected to live to the beginning or middle of October, because they are strong and fly out but little in August. The queen at the start lays only a few hundred eggs per day, as the weather is yet cold, but gradually she increases the number, and on August 30th has laid about 1000, or 12,000 in these 20 days, at an average of 600 every day. These 12,000 cells cover 240 square inches of comb. From September 1st to 20th 12,000 bees have been hatched, and the total number is $10,000 + 12,000 = 22,000$ on the latter date. As bees begun to hatch from September 1st, and the weather is now warm the queen increases laying, and to the 20th September, in 20 days she has laid at least 25,000 eggs, or 1250 per day, which cover 500 square inches of comb. These 25,000 bees hatch from September 20th to October 10th, and as we have 22,000 bees on September 20th we must have 47,000 on October 10th. Deduct therefrom 5000 of wintered bees as being lost, there remain 42,000 bees. The queen has by this time reached almost the maximum of her laying powers, and her field is very large, about 35,000 eggs in 20 days, or 1750 per day have been laid, and they cover 700 square inches of comb. From October 10th to 30th these 35,000 bees more have hatched, and as there were 42,000 on the 10th, there are on the 31st $42,000 + 35,000 = 77,000$. Deduct therefrom the last 5000 of wintered bees and 2000 of those first hatched, there remain 70,000, or about 14 pounds of bees in the hive, besides brood in all stages to the enormous extent of 40,000 cells, 2000 eggs laid each day for the past 20 days. These 40,000 cells cover 800 square inches of comb. Should the immense number of 70,000 bees not feel inclined to swarm just yet, then on the 20th November they would have increased from $70,000 + 40,000$ to 110,000, irrespective of loss, which will amount to about 10,000, so that the round and nett number of bees actually amounts to 100,000, or 20 pounds. Whether this colossal number of bees now swarm or not is henceforth of no difference to the fertility of the queen. She has reached her maximum when her progeny amounts to 100,000 subjects alive. If they don't swarm the queen from now gradually decreases her laying and remains stationary for a couple of months at about 1000 or 1500 eggs per 24 hours, while at the end of March, or in April, her laying ceases altogether, to begin again next spring. The immense number of bees also gradually decreases, as from now their actual work of honey gathering commences, and towards winter there won't be many above 20,000.

I have used round figures as near as possible to the point, which I consider justifi-

fiable, and I have taken dates when the breeding commences in most parts of Australia; but should I have been too late for some more sunny parts, why, the thinking beekeeper can easily correct that for himself. In general he will find these figures practicable. But in order to crush any polemic criticism in the bud, I will mention a few extra examples.

Occasionally a queen has laid in 14 days 50,000 eggs, or 3570 per day average, which is 51 per hour, and $2\frac{1}{2}$ in three minutes. But as it cannot be expected that a queen lays without stoppage or resting, let us assume she laid for 10 hours and rested for 14 hours each day, then she must have laid 357 in an hour or 6 in a minute. Perhaps others have watched their queens as well as I have, and if so they will agree with me that it is an exceedingly rare case to see her lay 6 eggs in the minute. And such extraordinary fertility only lasted for a short period. This was the circumstance—A hive had lost its young queen just before her expected impregnation. The bees might have been from 12,000 to 15,000. All combs were a year old worker cells, only a corner in the back frame being drone cells, and all or most all cells were polished and ready for the queen to lay. A day or two after a swarm issued from a pretty strong hive, but on account of it being somewhat windy, and I think because the queen was heavy, she fell to the ground and was only discovered when most of the bees began to return again, so that only about 12,000 bees settled with her. This being a weak swarm, I put it into the queenless hive. Fourteen days later I found 50,000 cells, or 1000 square inches of comb brood in all stages to 14 days. I removed immediately three frames and placed empty ones instead, but when looking in again six days after, I found these combs mostly filled with honey, undoubtedly because honey was more plentiful now. So this queen laid 3570 eggs per day for 14 days. She proved hereafter always very productive, but never to the same extent again. I had several similar cases.

In another hive, a young and lately impregnated queen was introduced to a strong colony of bees. Within 15 days after her start the brood covered 900 square inches, equal to 45,000 cells. She laid 3000 eggs each day. The empty combs given her were also mostly filled with honey, although they had a place in the broodnest.

Another hive with a very fertile queen had a wide passage from brood to honey room, of which passage the queen made use, and I found 1324 square inches of brood or 66,200 cells. That queen must have laid 3310 eggs every day for 20 days. To avoid unnecessary disputes, I wish it to be understood

that a bee hatches in 20 days, not 21 days, as others stated; some leave their cell in 19 days.

Again, another hive had 800 square inches of brood. I removed the first and last comb, which contained honey and pollen, and inserted two empty combs in the centre. The queen was soon hard at work, and five days after they were full of eggs and young larvæ; they were removed and two others given, and they were almost full in another five days; they were also taken away and replaced by two more empty ones, but these were filled with honey almost from top to bottom; also other cells that became empty by hatching bees. As the 800 square inches were kept full of brood, and the four combs which I removed measured 400 square inches, this queen had laid 60,000 eggs in 20 days, or 3000 per day for 10 days.

Much greater are the number of eggs laid by these queens within a short time compared to my former examples, it must be born in mind that then I referred to queens usually in existence, while here I cited a few exceptional instances, which only prove the rule. What some queens can accomplish, and what most queens do accomplish are two very different matters. My experiments were made with Italian bees, but other races will prove but little different.

Besides the classes of queens referred to there are many that never reach the mark of laying 2000 eggs in a day. These instances are far more plentiful than the other, and I do not think I need show it by further figures. The time of the season and the weather both have great influence over the queen as well as the bees; dry and windy weather checks breeding; moist, warm and close weather, with fresh honey not too plentiful, induces it. A two or three years old queen is often as fertile as a younger one, and a big queen is not superior to a middle-sized one; but a small queen is shortlived and not of much value.

I have thought that if young queens were reared from the most fertile only, they might inherit that quality and remain constant; but I found that no matter how carefully it is executed the young ones only prove about middle class; while I have had excellent layers from poor mothers. Here, again, I came to the conclusion that a higher power than ours has provided that the "trees may not grow into heaven."

The bees have undoubtedly a great influence upon the queen. In winter, when the bees rest, the queen lays no eggs at all; again, in summer a queen in a nucleus lays but a small number of eggs, but if introduced into a strong stock she lays a thousand or more after a day or two; and again, towards the end of the season she gradually leaves off

laying. What is the cause? Surely the food the bees give her. When a desire for much brood arises the queen is fed plentifully, so that she is able to produce such quantity of eggs as her natural strength will permit; when no brood is desired the queen receives or takes such portion of food as is necessary for her existence only. Perhaps the queen's own instinct guides her doing as well as the bees theirs; but we have proofs also that the queen is influenced by the bees.

This article would not be complete without a few remarks in regard to the hive pertaining to the above. The hive must be so constructed as to afford ample space for a good but not an exceptional queen, and as such is capable of laying 2000 eggs per day for 20 days, there must be room for more than 40,000 cells in the hive. The 40,000 cells cover 800 square inches of comb. Now, the Langstroth frame is inside measured $17 \times 8\frac{1}{2}$ inches, and ten frames in each hive. $17 \times 8\frac{1}{2} \times 10 = 1445$ inches, and 50 cells to an inch makes $1445 \times 50 = 72250$ cells. If these 72250 cells shall be used for breeding purpose, for which they are designed, then the queen in every hive must lay at least 3500 eggs per day for 20 days to fill 70,000 cells, when yet 2250 cells are left for honey. But the queens do not lay 3500 eggs every day regularly; they lay only 2000, and consequently there are 645 square inches of comb, or 32,250 cells in reserve, for exceptional purposes, it seems.

The Berlepsch hive, with ten frames, and which I use, measures $8\frac{1}{2} \times 14 \times 10 = 1155$ square inches in combs, or has 57,750 cells. To use 55,000 cells for brood, the queen must lay 2750 eggs a day for 20 days, and when 2750 cells remain for honey and pollen. If she lays 2000 eggs a day 40,000 cells are needed, and 17,750 can be utilized for storing honey, etc., and as about 1250 cells of honey make a pound there is, besides 40,000 cells for brood, space for at least 12 pounds of honey, while a more fertile queen has space afforded for nearly 3000 eggs per day, and the number of bees may increase to 100,000. But I find usually that the bees would not allot all cells for brood, they filling them with honey when it can be gathered. I have also stated before that too strong colonies are not the most profitable ones. It is therefore quite evident that my hive with 57,750 cells is sufficiently large enough to be profitable.

In a hive with 72,250 cells, and deducting 40,000 for brood, there is capacity for at least 25 pounds of honey besides the brood. Is it for fear that the bees might forget to stop breeding before the season is over, and are thus provided with winter's stores: or is it expected as a matter of course that they breed the faster the larger the

hive? No! Because these stocks are no stronger, the swarms are no bigger than in the other. Let me see. Assuming it was so, it is reasonable to expect that there are at least 15,000 to 20,000 of bees on the 10th of August, when we will assume she begins to lay again. In this case she ought to lay 1000 eggs per day average to the 30th of August, because there are more bees at hand. From September 1-20 she ought to lay 1500 per day, and 2000 per day from September 21st to October 10th, and 3000 per day from October 11-30th. And these are the figures of bees: On September 1st, 20,000 (bees from winter), from September 1-20 hatched 20,000, makes 40,000 in all; hatched Sept 21-October 10th, 30,000, makes 70,000 in all; hatched October 11-30th, 40,000, 110,000 in all; and hatched from Nov 1-20th, 60,000, or, regardless of loss, we have now 170,000 bees and 60,000 cells full of brood. Deduct the probable loss of the 20,000 wintered bees, and the first reared 20,000, and we have the number of 130,000 live bees, which weigh about 26 pounds. Now, who has, or had, a hundred, or ten, or one hive with that total? If you have not 51 out of 100, then it is an unsuccessful attempt to argue that the brood-room, with 72,250 cells, is not too large; although there were yet 12,250 cells left even then and there for other than breeding purposes.

What cannot pass unnoticed is this: Comparing the two tables of possible increase, the one starting with 10,000 bees increased to 100,000 to Nov 20th; the other starting with 20,000 increased, or is supposed to have increased, to 130,000, or shows only a surplus of 20,000; while it must be affirmed that the greater consumption of food would hardly be covered by only 20,000 bees more, as 38,000 more larvæ have been fed in the one hive than in the other.

In conclusion, I recommend those facts and figures for your serious consideration; see which comes next to your own experience on the subject; form your own opinion accordingly, and adopt the best. Accept the assurance that only after long and careful studies and experiments satisfactory conclusions can be drawn; and avoid being led astray by mistaken surmises.

P. W. ABRAM, Manager,
Italian Bee Company.

Parramatta, New South Wales.

Reports from Colonial Apiaries.

LEGISLATION WANTED.

The prospects for this season are very good, so far as honey flow, as this is the year for the red gum to blossom, and there will

be plenty of honey for the bees to gather, from the middle of this month right up to the end of March, but unfortunately there is one great drawback, and that is that there will be very few bees left in this part to gather honey, as foul brood has been extremely prevalent, and in most cases has just cleared the bees right out. I have the misfortune to have people keeping bees all round me, and I am sorry to say in anything but an intelligent way. One cannot tell most of them anything, as they know all about beekeeping: "Did not the most of them keep bees before I did, and therefore ought to know more than I could tell them." I saw a man to-day, who at the beginning of this winter was the proud possessor of six frame hives. He used to keep bees in Germany. I said, "Well, Mr., how are the bees doing?" "Oh," said he, "they are nearly all dead; your yellow bees stole all the honey they had, and they died from starvation." I asked him to let me have a look at them. He did so, and it was just as I expected. They were one rotten mass, with foul brood, and out of the six colonies there was just about enough bees left in one hive to cover two frames; the other hives were left on the stands, entrances open, just as if there were bees in them. For myself, I had to reduce from 40 colonies to 22. I had only two sound stocks out of that number; but I am happy to say that now I have only one colony affected, and I will be able to clean that by requeening as soon as I have drones flying, which will be in about 14 or 15 days. This is my usual experience; and as you well know, profitable beekeeping under these circumstances is an impossibility. I can most certainly cure the disease every time without the loss of a single comb; but to what good when one has near neighbors who "keep" bees.

SPRINGING BEES ON THE BLUE MOUNTAIN BEE FARMS.

About the first of August in each year I go through all the hives in my farms. The objects are to note condition of the queen, amount of brood, amount of honey, and general state of hive. If the season is opening well, I will usually find about two frames of brood in each hive. I always work under a tent at this time of the year, to prevent robbers getting a start, as bees are always ready for that game in early spring.

I leave my bees on ten frames, with plenty of honey all winter, and on opening in spring, the first thing is to find out where the brood nest is located; when found it is put in the front of hive and division board put up, so as to crowd bees on to four combs.

My frames run across the entrance, which is much the best way for several reasons. The hives are then left until middle of month, when, upon examination, the four frames will be found solid with brood. The empty combs from the back are now put in between each frame of brood, so that the queen will fill them with eggs, the division board must of course be moved back. The queen is now found, and one wing clipped—to do so earlier in the season would endanger her life; all poor queens are weeded out, their places being supplied with queens from our nuclei hives. I am very particular about laying qualities of my queens, I get the very best imported stock I can, regardless of price, as in this more than anything else lies the secret of success in bee culture. All queens that do not come up to the standard as to amount of brood or gathering qualities of the workers, are cleared out at once. I do not judge a queen at all by colour, as I have so often found the very light golden queens to be the greatest loafers in the farm, very gentle and *very* lazy. Do not on any account, if you want your bees to pay, keep a queen because she and her workers are very pretty; there is a great temptation to do it, I know, but it does not pay.

MAJOR SHALLARD.

Blue Mountain Bee Farms,
Glenbrook.

Correspondence.

To the Editor of the Australian Bee-keepers' Journal.

DEAR SIR,—I want a few hints. My bees have *really never stopped working all the winter long*, and now, what with early almond and peach blossom, *Blue Gum*, *Wattle*, *Beans*, and sundry other garden flowers, they are at it hot and heavy all day long. All the hives contain brood—new honey—some sealed, and some new comb. I left a fair amount of honey for winter, some of which is still untouched, so I suppose I may look for very early swarms next month. Now I am sorry to find a little foul brood in four of my hives. One had foul brood last year, and I gave it Muth's treatment, minus the starvation, just at the close of the season, and fed them well. Now I find still some foul brood in this time, and it is rather weak in number of bees, and I am uncertain what is best to do with it, and also with the other foul brood hives, which are pretty strong.

Should I transfer them to new hives and combs at once, and feed them, leaving the young brood to perish, or should I cut out the foul cells, and dose well with salicilic

acid or carbolic acid, and try to save the young brood?

I am afraid if I shift the weak hive to new hive and frames, they will just die out. I should be thankful for a little good advice in season.

Yours truly,

CHARLES ALWILSON.

Teasdale, Aug. 20, 1889.

[Our advice in such a case is to deal with the disease promptly and vigorously; if the stocks are badly affected, destroy them at once, by fire, if, however, there is plenty of healthy brood with diseased cells spread amongst it, adopt the course we have already advised in these pages, as follows:—Put a clean hive with from four to six frames (with starters only of foundation, and food in a feeder), in it. Remove the diseased hive away some little distance, and put the new, clean hive in its place. It will be best to take the diseased hive 20 or 30 yards away, behind bushes, a house, or shed, so as not to be near, or exposed, to the bees in the healthy hives. Now shake all the bees from the frames one by one into any light box, such as a gin case or old box hive, and cover up each frame immediately the bees are off, (to prevent other bees from getting at them). When all the bees are off the frames take the box in which they have been shaken to the new hive, and prop it up in such a way that the bees can easily crawl from the box to the alighting board of the new hive, which they will soon do, queen and all. We generally catch and cage the queen before shaking the bees off the combs, and release her on the alighting board of the clean hive as the bees run in. It will be necessary to feed freely for a few days, even if honey be coming in, and for food we certainly advise white sugar syrup, (made as already directed), unless honey from absolutely healthy colonies can be obtained.

The removal from the infected combs and hive, new food, and a large demand for wax secretion, for comb building, appears to effect the cure, at least so we have found in every instance we have carefully carried out the plan here recommended.

The precaution most necessary is to prevent any healthy bees getting at the combs during the operation or after. We find that putting the combs into a tub of boiling water as soon as they are free from bees is the best plan, as it destroys all germs at once, and the wax can be recovered and properly extracted afterwards. In case of badly diseased combs, burn them in a good big fire at once, and try and save nothing.—ED.]

To the Editors of the Australian Bee-keepers' Journal.

As you are asking for letters from bee-keepers I thought I would give you my experience. First, let me say I am a novice in bee-keeping, two years ago I did not know there was such a thing as a bar-frame hive. To begin then, my

bees are all black, or wild bees taken from the bush. October, 1887: had one swarm during that summer, made up to 23 colonies, procured a bar-frame hive, from Mr. Lloyd, of Albert Park, for a guide, as the carriage is too high for me to deal with the city. October, 1888: 23 colonies, all strong swarms, most of them in frame hives; during that season made the number up to 73 colonies. Took £80 worth of honey and wax from them. As I did not get an extractor until very late in the season you will understand the disadvantage we were working under. Went into winter with 62 colonies. September, 1889: 62 colonies in frame hives, most of them are fairly strong. At present they are hiving in honey, and getting more brood in the combs daily. In fact things are looking very promising for a busy time in a few weeks.

As regards bee forage, I think that the district is fairly good. We have gums, several kinds of box trees, stringy bark, several varieties of mallee, wattles two kinds, and a large number of desert flowers—in bloom most of the winter.—With regard to each kind I will say more at a future time. I have sold my honey, locally, as fast as I could supply it. The wax I send to Melbourne, and get foundation in exchange. I have rigged up a circular saw bench, and make my own hives.

In conclusion I must tell you that we look forward for the journal with pleasure, and I wish it every success.

JOHN THACKER.

Pine View Apiary,

South Lillimur.

Extracts.

MODERN BEEKEEPING.

A HANDBOOK FOR COTTAGERS.

(Continued from Page 156.)

VIII.—ARTIFICIAL SWARMING.

To avoid the trouble of watching for swarms, and the risk of eventually losing them, methods of swarming artificially are used now by all advanced beekeepers. We will explain a few of the more simple of these. Artificial swarming cannot, of course, be performed so readily or neatly with skeps as with frame hives. If we have but a single skep to swarm, it should not be done unless the stock is very strong, and apparently near the condition in which it would be likely to swarm naturally. Nor must we make the swarm at all if honey is not abundant, unless we are prepared to carefully feed it, until it is independent of our help. Two empty skeps will be required—one to occupy the old stand and receive the bees returning from the fields, while we are at work with their proper home; the other to receive the driven swarm to be made, as explained in the last chapter.

During the driving, a sharp look-out must be kept for the queen, and a little practice will enable the operator in almost every case to pick her out as she scampers up amidst her terrified children; but if she be not found, the bees must either be returned, and a second attempt made another time, or the driven swarm must be placed on the old stand and watched. If the bees remain quietly clustered in the hive, the queen is almost certainly there; for, if she be not, the bees will commence rushing wildly in and out searching for her. In this case, the old hive must be driven again until she is secured, and added to the driven bees, or we must give it up and return the bees. Not more than half the bees need be driven if the queen has been seen to join them, and a sufficient number must always be left to build queen-cells and hatch out the brood.

If you intend to keep both stock and swarm, place these on opposite sides of the old stand, with an interval of not more than three feet between them, so that each should have an equal chance to receive bees returning from the fields. If one should appear too weak, it will be strengthened by drawing it nearer to the old stand, and removing the other for a time.

If you have sold your swarm, pack it up and put your stock in its former place.

Making Three Skeps Out of Two.—If we have two stocks, and neither is ready to swarm naturally, we may make an artificial swarm out of the two as follows:—In the early part of a fine day, when bees are flying freely, drive, as nearly as possible, every bee from the first stock—of course, securing the queen—and place this driven swarm on the old stand. Now put the hive of combs and brood that has lost its bees upon the stand of the second stock, removing this to a new position. This plan is extremely simple, and has, in addition, the advantage of giving a strong early swarm, consisting of all the bees of the first stock. The bees of the second stock, on their return from the fields, enter the first hive, and perform the work of raising a new queen, while the young bees of No. 2 remain with it; and from constant hatching of brood it will soon become as strong as at first.

This method is also suitable for frame-hives, substituting the shaking of bees from their frames, as explained in the latter part of this chapter for the troublesome process of driving.

Ten days later we can make another swarm, by driving all the bees from the second hive, when the first hive now raising queens will go to a new station, and the second driven hive will be placed in the position it occupied.

We have four stands in a line No. 1, 2, 3, and 4. The two stocks A and B are placed on 1 and 2, thus making three out of two the artificial swarm. In ten days three are again made out of the two old stocks, A and B, the latter one this time furnishing the swarm, when the position will be—Stand 1, A's swarm; stand 2, B stock; stand 3, B's swarm; stand 4, A stock.

But in A stock there are now a number of queen cells sealed; one of these is only required

for requeening the hive, and one, or, for fear of failure, two, may be cut out with a square inch or so of comb, attached and inserted between the combs of B stock, special care being taken that its end is not pinched, and that it is left perfectly free for the escape of the hatching queen. This will have the effect of giving to a stock a queen ten days earlier than they could have raised one themselves. This is of immense consequence, as we shall see if we remember the number of eggs a queen will lay per day in summer. It is not safe to remove queen cells until near the time of hatching, which may be known by the roughening of the ends through the partial removal of the wax.

When moveable combs are used, swarming may be very quickly performed by removing the frame hive to a new stand, and lifting from it a comb of brood, with the queen and its adherent bees. This is placed in a new hive on the old stand, which should be furnished, in part at least, with comb or foundation. (See *Guides and Foundation*.) The gap made in the stock should be closed up by drawing the frames together, as the bees, finding an empty space in the middle of their hive, would fill it up with drone comb. Queenless bees never build worker-comb if left to themselves, but foundation, if given, will make drone comb building, with one important exception, impossible.

If we have sold a swarm, we make it thus. Having given a puff of smoke to induce the bees to fill themselves with honey, we remove the stock, and place a large flat board on its s and; upon this we put a skep or box to receive the swarm, propping up the front edge of the former with a stone or wedge. The comb on which the queen is found is now carried to the skep; she is gently lifted up by the finger and thumb, grasping her over the roots of her wings, and placed at the hive door; the comb is now sharply jerked downwards, the bees fall, and with the queen run into the hive. Comb after comb is brought and shaken as the first, until enough bees for the swarm have been collected; and if in a skep, when well clustered, they may be lifted quietly on to a piece of canvas, its ends gathered up and tied securely. Swarms in skeps should always travel mouth upwards. The swarm being removed, the stock should be returned to its old stand. From this explanation, the way of making two stocks in frame-hives into three will be understood.

Hiving swarms into frame-hives from skeps may also be very easily performed as follows:—Having removed the quilt and two or more frames, shake the bees from the skep by a sudden jerk into the hive and cover over with the quilt; when they have clustered, replace the frames and quilt, and the operation will be completed.

IX.—SUPERS AND THEIR MANAGEMENT.

Combs containing honey alone, and spotless in their purity, can only with certainty be obtained by inducing the bees to build in chambers, partially separated from the hive

body. As bees naturally store their honey above their brood, these chambers are generally placed over the hive, and thence are called "supers." A straw skep having a large central hole may be supered, if first a thin flat board be fixed over it, tempered clay or something of the kind being used between the hive and board to give the latter a firm resting place, and to prevent the escape of heated air. All supers, whether on skeps or frame-hives, must be well protected by some warm covering of flannel or cloth or other such like material. They should also be furnished with guide comb or foundation, and if they be of glass this is the more necessary, or otherwise the bees, being unable to hold to the roof so as to commence their comb in the natural way, will be obliged to build upwards, which is a slow and wasteful process, and combs so built are liable to fall over, and thus spoil the appearance of the super. To fix guide combs to glass, some pieces of perfectly clean, empty comb should be taken, the glass should now be slowly warmed, when the combs, by simple pressure and a gentle rubbing movement, will stick sufficiently. The bees, if ready for super work, that is, if really so strong in numbers as to begin to feel crowding while they are gathering honey freely, will form, by linking themselves together by their hooked feet, a ladder between the bottom of the guide comb and their hive proper, and will start at once the work of fixing and building. But glass supers, however beautiful to look at when filled, are uncertain both on account of the bees in them being disturbed by the admission of light, and from the extra labour to the insects in attaching their combs, and are fast giving place to racks of sections. Boxes about 5 in. deep and furnished with frames 2 in. wide, with a $\frac{1}{2}$ or $\frac{3}{4}$ space, will make fairly good supers. The combs, guides being of course given, will be built in the frames, and these can be offered separately for sale, when they will find purchasers much more readily than large supers. In fact, the large supers, once the pride of the beekeeper, are now passing out of use, except for extracting and returning to hive to be refilled, as they are more liable to breakage, and less saleable. What are termed "sections" are taking their place; these consist of little boxes having top sides and bottom only, but without back and front, like small but wide frames, which can be placed side by side over the hive. In America these have been largely used, and in 1878 and 1879 nearly 200 tons of honey came to us in this shape across the Atlantic, chiefly from one firm of honey-dealers; and in all large English towns these neat little boxes of clean white honey-comb became a familiar sight: but they were not so pleasant to the taste, for those once so eager for American honey did not come again. These sections have now come into general use, and may be seen at all our shows, where they readily sell at remunerative prices.

X.—SECTION BOXES.

The ordinary section holds about 1lb. of honey. The wood of which it is made is $\frac{1}{2}$ of an inch

thick; the dimensions are $4\frac{1}{2}$ in. by $4\frac{1}{2}$ in. by 2 in., but the top and bottom pieces are only $1\frac{1}{2}$ in. wide, in order to allow the bees to pass through the spaces left between the narrower bottoms when the boxes are put side by side. To make these sections neatly is beyond the skill of most people; but they can be purchased of most hive-dealers so cheaply as to make substitutes unnecessary, their price being from $\frac{1}{2}$ d. to 1d. each. They are made in one piece, and merely require to be folded, and the two extremities, fitted into each other to complete them. They are used both on the top of the hive as supers proper, and in the hive towards the side where honey is also stored as well as above. In this case a wide frame is fitted with them, and as the sections are filled they are removed, and empty ones put in their places.

We must now explain how the section boxes are placed upon the hive. Almost every beekeeper has some peculiarity in his method of placing his sections. A frame, termed a rack, should be made of wood $\frac{1}{2}$ in. thick, upon which the boxes may so rest that the bees will have an opportunity of running freely between them and their frames, the thicker pieces, about $\frac{1}{2}$ in. high, fixed upon this frame, and between which the sections stand, answer two purposes: first, the boxes, which are often fitted over the hive in three rows, have a space between their sides, which gives finger room in lifting them out, and next they form the resting place for the separator, which now needs explanation. If the combs were not finished with perfectly flat faces, and with regular thickness, the comb of one box would intrude into another, and so prevent the glazing. All this is avoided by the separator, which may consist of tin, zinc, glass, or wood, placed between the rows of sections. But glass is too thick to be desirable. The bees work away from the guide or foundation given them, until the separator prevents further building, and the sealing over the comb has in consequence a perfectly flat face. Should the case of sections not wholly cover the hive top, the openings must be closed up in some way, slips of carpet or wood being useful.

As the boxes get sealed over they should be removed, empty ones taking their places. But if honey is not coming in very fast, it is better, after taking some completed ones from the centre of the rack, to fill the gaps with the half-finished ones from the sides, and either reducing the size of the rack, or filling up with empty boxes, as may seem most desirable. Our hints on "Quieting Bees" will now be useful, and a goose wing or painter's dusting brush will quickly get rid of all the bees, especially if we also shake each box in the line of the comb as sharply as it will bear without risk.

On obtaining supers, just three hints, upon the understanding of which too much stress can hardly be laid. 1st.—You may have four hives no one of which is strong enough to gather surplus, for remember weak hives never yield a profit. Before the honey glut comes get your four lots into three, or even two, and boxes filled to an extent that will surprise

you will probably reward your pains. Many a beekeeper has numerous stocks with nothing but losses, where the same number of bees in fewer hives would have set him talking all the winter about the profits of beekeeping.

Read "Uniting," and do not think that this is only to be done when the honey harvest is passed.

2nd. — Even in the best managed apiaries it is often found, at the time the honey harvest opens, that some hives, though rapidly increasing, are not sufficiently crowded to take advantage of super space, while the honey yield is so short in duration, that to wait while the bees are multiplying is to lose it altogether. If comb honey be our object, wise management would now either unite, as we have suggested, or, in the case of frame hives, contract the hive, removing every frame, filled or unfilled, that does not contain brood, leaving only those which are necessary for the egg-laying of the queen, and using a division-board, as explained under "Wintering." The bees, though not particularly strong, are crowded aloft, and super boxes become ours, where but for this plan, we could have had no hope. But it must not be overlooked that, as the bees have no room for store in the hive-body, they will be left so poor at the removal of the sections that sugar must be supplied to them; but our profits, as well as our experience, if we have it, will cause us to do this with a cheerful heart and a generous hand. Remember that feeding must never be done while sections are on or they will be filled with syrup instead of honey, and any such exhibited at a honey show would be disqualified, and considered a fraud.

3rd. — It is sometimes difficult to induce the bees to take possession of empty sections when placed on the top of the hive, and they will occasionally swarm rather than enter them. If, however, some of the sections are placed in a frame in the body of the hive, beside the cluster of bees, they will readily commence working in these. They must, of course, be fitted with dividers or excluder-zinc to prevent the queen getting at the sections. As soon as they have been fairly started the sections may be removed, with the adhering bees, and placed upon the top of the hive and the frames re-filled with empty sections. The bees in the body of the hive, finding their comrades at work above, soon join them and continue their work in the supers which had been commenced in the body of the hive. Immediately the sections in the hive are well started they should be placed on the top for completion. All unfinished sections, at the end of the season, should have the honey extracted from them, the combs being returned to the bees to be cleared by them of the little honey remaining in them. They may then be kept in store for use next season.

CLIPPING THE QUEEN'S WINGS.

Many of our best beekeepers practise clipping the queen's wings. The operation is a simple one. Catch the queen by the wings between the

thumb and forefinger of the right hand, then take her by the head and thorax, using the thumb and first two fingers of the left hand, at the same time releasing her wings and using the right hand to manipulate a small, sharp pair of scissors. Cut off two-thirds of one wing. Do not hurry. Do the work slowly, and be careful not to allow her to thrust a leg up between the jaws of the scissors. When the wing is clipped, place her back upon the comb and return it to the hive. When the colony swarms, the queen of course tries to go with the bees, and she will be found crawling about in front of the hive. She should be carefully caged, the old hive carried away a short distance, and a new hive all ready for the bees put in its place, the cage containing the queen being laid at the entrance. The bees finding that the queen is not with them, soon return and enter the new hive, thinking it is their old home, or they think so until they get inside, but as the queen is soon released and allowed to go in with them, they conclude it is all right and go to work, thus they are made to hive themselves. This method has the advantage that, when several swarms issue at the same time, the work of separating them is greatly simplified, as the queens are all caged. There is also no danger of losing swarms, as the bees will not leave without their queen. When the queens are clipped the grass must be kept close cut about the hives, or there will be danger of losing queens. Salt sprinkled about the hives will keep the grass from growing. — *Mildura Cultivator*, July 11, 1889.

INCREASE.

MY PLAN FOR MAKING IT BY DIVIDING.

Written for the Farm, Field and Stockman.

BY S. E. MILLER.

No doubt most of the readers have seen a great deal that has been written about artificial swarming, but perhaps have not taken the pains to try it. As my brother and I tried last year with one swarm, and were so well pleased with the result, that we tried it on several colonies the present season with satisfactory results. I will give our method.

As the beekeeper with a number of colonies has generally plenty of other things to occupy his attention during swarming time, it is not at all a small job to be continually on the watch during the hours that they are likely to swarm, viz., from 10 a.m. to 3 p.m. Therefore we concluded to help all of those along that were making preparation for swarming, and thus relieve ourselves for a time, of the trouble of watching them. Even though our queens' wings are clipped, we do not like to have a swarm issue and return again without us having any knowledge of the fact.

We go to a colony that is strong enough to cast a good swarm (and are likely to be making

preparations to do so), remove the hive far enough from its original stand to be convenient, and place new hive on said stand.

The frames may be filled with empty combs, full sheets of foundation, or foundation starters, at the discretion of the operator. We use only foundation starters, and I would not advise using empty combs, for in case there is a large flow of honey the bees will soon fill the combs with honey, and the queen will be left without cells in which to deposit eggs. If honey is coming in at a rate to warrant it, and you wish to run them for comb honey, put on the surplus receptacles at once, and close the hive, all ready to receive the bees. To insure their staying, it may be well to put a frame of brood in the new hive.

You are now ready to open the parent hive, and shake the bees in front of the new one, and let them march in. If the weather is warm, you can take nearly all the bees from the old hive, as the new one is the one from which you must get your surplus; be sure to get the queen into the new hive or she may get lost in the grass and never find her way into the hive, that is if she has clipped wings. You can now move the parent hive to a new stand, but before leaving it, cut out all queen-cells but one (the best looking and furthest developed), and in eight days cut out all new ones that they may have started.

If they have no cells started at the time of swarming, they will only need to be removed the eighth day, of course leaving the best one to hatch as before stated. I am well aware that many older bee-keepers than myself will not favor this method, while there are some of the successful veterans who practice it, or something similar, almost exclusively. Taking all things into consideration, I think there are some advantages in it, while we have yet to find any disadvantages.

What bee-keeper has not seen a colony apparently in a condition to cast a powerful swarm, lingering day after day with a great cluster hanging on the outside of the hive that might just as well be storing many pounds of honey, as lounging around doing nothing?

This was the case with those we tried last summer, and although it was at a time when other colonies were doing almost nothing but trying to rob, they drew out the foundation, and in a short time built up to be a strong colony, wintered well, and came out in the spring quite strong.

We have now in our apiary a number of colonies that were swarmed artificially on or near the same dates as others that cast swarms naturally and were hived according to the same method. Taking it on an average, I can see no difference in their present condition.

I would not, however, advise anyone to practice this method on a large scale, without first trying it with a few colonies to see how they like it, and it would not be wise to try it when bees are not swarming naturally.

Missouri.

PREVENTING AFTER-SWARMS.

A. E. MANUM'S METHOD.

Having noticed in *GLEANINGS* and other bee-periodicals, from time to time, various plans to prevent second swarms, all of which I have tried without satisfactory results, and having finally adopted a method of my own which is somewhat different from any I have ever seen in print, I will, with your permission, give it to your readers, that another drop may be added to the great fountain of knowledge from which a clear and invigorating stream is constantly flowing over the pages of the *GLEANINGS*.

As stated above, I have tried various plans to prevent second swarms by hiving in different ways, such as moving the old hive to a new stand, and hiving the new swarm on the old stand; also setting the old hive on the new swarm or the new over the old; also hiving the swarms by themselves, and giving them a portion of the brood from the parent hive, etc. All of these have proved to be unsatisfactory to me, owing to the fact that these methods have a tendency to lessen the amount of surplus, since the old hive is so reduced that it is a long while before it becomes strong enough to work in the boxes. Hence we have only the new swarm to depend upon for a surplus, where we depend wholly upon clover and basswood for box honey. I always aim to keep every colony strong—the ones that have cast a swarm, as well as the new ones. My experience teaches me that light swarms during the honey season give no profit. I would rather have half a bushel of bees in one hive than divided by two, hiving a peck in each hive, when the honey season is at hand.

In hiving bees, the plan that suits me best is to return one-third of the swarm to the old hive, and hive the remaining two-thirds in a new hive, and add to it, as soon as may be, one or more two-thirds swarms (without queens this time), each time returning the third of the bees to the hive from which they came. The surplus queens, if good ones, may be returned to their respective hives after cutting out all the queen-cells. By this method the old hive is kept well stocked with bees, and work in the boxes is but little interrupted; the new colonies are made very strong, and in the best of condition to store a large amount of honey in the boxes. As I do not desire a large increase of colonies, I strive to secure a large surplus, regardless of increase.

To prevent second swarms I go to the hive four days after a swarm has issued, lift out the combs one by one, and cut out all queen-cells but one, leaving the best one if I wish to rear a queen from this stock; if not, all are cut out, and a cell from some other introduced. Then in four days more I cut out any queen-cells that may have been started, after which there is no danger of more being started. Now, when a young queen hatches and finds no rival, and the bees not being able to rear another, owing to the age of the brood, the young queen is permitted to leave the hive for fertilization, without the bees following her; and in due time she will

commence to lay. But if the young queen is allowed to hatch *before* the other cells are removed, as recommended by some writers, even if the cells are removed very soon after the queen hatches, there is danger of a second swarm. But if all surplus cells are removed *before* the queen hatches, there is no danger of a second swarm; at least, that has been my experience the past few years.

One night last season my son reported six second swarms that day (this being only his second season in having charge of an apiary, and he had forgotten my instructions of the year before); upon inquiry I learned that he had not removed the cells the second time; or on the eighth day, thinking that, if he removed them soon after the young hatched from the cell left in the hive when looking them over on the fourth day after the swarm had issued it would be as well. But the result was six after-swarms in one day. I visited his yard next day, and assisted him to cut out the surplus cells from all that had swarmed seven or eight days previously, and cautioned him to attend to this matter in the future, which he did, and the result was no more second-swarms.

It may be asked, why I cut out the cells so soon as the fourth day. My answer is, that it sometimes happens that a swarm is retarded from coming out, for some days, owing to bad weather or some other cause. In such a case the young queen will hatch sooner than the eighth or ninth day; hence this precaution. As second swarms are unprofitable to me, I aim to prevent their issue; and by close attention I find they can be prevented.

Bristol, Vt., March 12, 1889. A. E. MANUM.

QUEENS.

GIVING LAYING QUEENS TO COLONIES IMMEDIATELY AFTER SWARMING.

Written for the American Rural Home.

BY G. M. DOOLITTLE.

For years we have been told that no colony should go without a laying-queen a single day, if it were possible to give them one, and plans for introducing queens, which required that the hive should be queenless a few days previous, have been severely criticised. We have also been told for years, that the bee-keeper who wished to secure the best results from his bees, should have a laying queen ready to give each old colony as soon as they swarmed, as the time lost to them, by rearing a queen, was equivalent to a swarm of bees.

Being eager to know for myself, all the plans which would give the best results, I have experimented largely, and the truth of the statement that the time lost to the bees in rearing a queen in natural swarming, was equivalent to a swarm of bees, is the reason it has not proven a success. If it were bees I was after, the case would be different.

With me, white clover yields only enough honey to keep the bees breeding nicely, and

prepares them so that they mainly swarm from June 20 to July 1. Our honey harvest is from basswood, which blossoms from July 10 to 16.

Now, all who are familiar with natural swarming, know that the bees are comparatively few in numbers in the spring, and increase by the rapidly increasing brood produced by the queen, which, in due time, hatch the bees, until a swarm is the result.

By giving a laying-queen to a colony immediately after it has cast a swarm, we bring about the same result (swarming) as before, for we place the bees in the same condition. The only difference is, that having plenty of brood, they build up quicker, and are prepared to swarm in a shorter time. As this second swarming, brought about by giving the laying queen, comes right in our basswood honey harvest, it cuts off the surplus honey, for it is well-known that bees having the swarming fever, do little or no work in the section-boxes, and if allowed to swarm, the object we have sought after (section-honey) is beyond our reach.

Having given the result of my experience on this point, let us look at how the same colony would work, had we not given the bees a laying queen. Eight days after the swarm has issued, the first young queen will have emerged from her cell, as a rule, when the apiarist should remove all the other queen-cells from the hive, so that second swarming is entirely prevented.

In ten days more our young queen is ready to lay, which is about the time the basswood begins to yield honey largely; during this period, between the time the swarm issued and the young queen commences to lay, the bees, not having any brood to nurse for the last half of the time, consume but little honey; hence as fast as the young bees emerge from the cells, they are filled with honey; for bees, not having a laying queen, seldom build comb in the sections, especially while there is no unsealed brood in the hive.

Thus, when the young queen is ready to lay, she finds every available cell stored with well-ripened honey. At this point, the instinct of the bees teaches them that they must have brood, or they will soon cease to exist as a colony, and a general rush is made for the sections, the honey from below is carried above, so as to give the queen room, and, in a week, we have as a result, the sections nearly filled with honey.

I have often had such colonies fill and complete 30 two-pound sections in from 8 to 12 days, while those to which I had given the laying-queen immediately after swarming, did little but swarm during the same time.—

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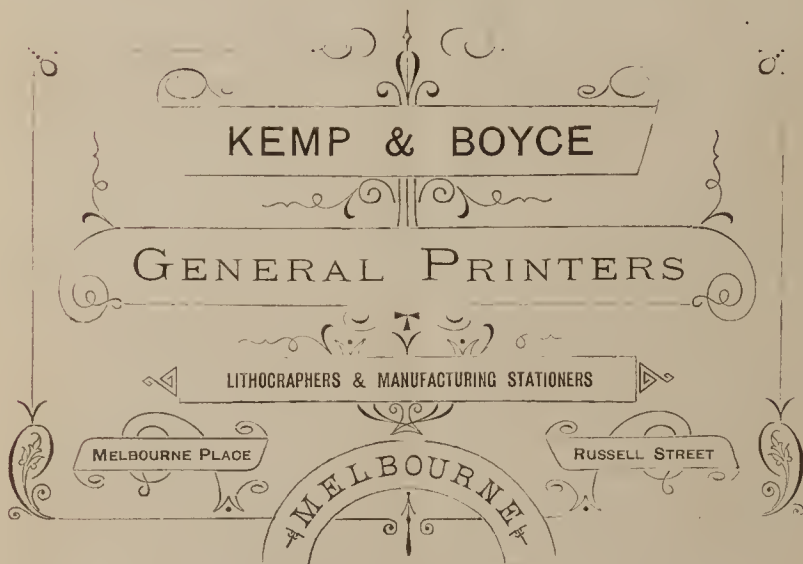
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Editorial

BEE GOSSIP.

CLIPPING QUEENS' WINGS.—This practice is adopted by a good many American apiculturists, chiefly with the view of preventing swarms from absconding, an event that is not at all uncommon in apiaries near well-wooded country, especially where there are already wild bees. In our last number, page 168, is an extract concerning this plan. A large number of beekeepers, however, condemn the practice, first because they consider a queen with clipped wings as defective, secondly because as many or more queens are lost in consequence of not being able to fly, as probable absconding swarms are saved. For our part we think it much a matter of opinion, although we have never adopted the method. We had a large swarm issue on September 24th, which clustered on a shrub near, but soon returned to the hive. Seeing a small cluster of bees on the ground near the hive we searched and found the queen, whose wings were so ragged she could not fly. She was put on the alighting board, and she crawled in. In the evening she was found on the ground again, and again put in. Next morning she was out again with a small company of bees. She was no doubt an old queen, but as she had a populous hive, which sent off a grand swarm, she could not have been past her laying powers. The weather became too bad to examine the stock, but the probability is swarming had been delayed till a young queen had hatched, and the old one had persisted in going out in any weather in preference to being killed by her own daughter.

If queens' wings are clipped, the ground about and near the hives must be bare of grass or much herbage, or it will be more trouble to find her than to chase an absconding swarm, for if not found at once, the bees that remain with her will often not be sufficient to attract attention.

Mr. Cheshire, in his recent admirable work on Bees and Beekeeping, speaking of Queen Clipping,

says, although it is largely in vogue in America some of the largest owners are against it, and he expresses his belief that queens thus maimed are more likely to be displaced by their subjects than those that are perfect. He considers properly conducted artificial swarming more advantageous in most respects, than queen clipping.

HONEY BOARDS.—Slotted honey boards with queen excluding zinc are coming largely into use, and our experience with them last year was so satisfactory that we intend using them in every stock we work for surplus in the super. They prevent brace combs between tops of frames and sections, and there is far less trouble in handling both frames and supers with these honey boards than without; the tops of the frames are cleaner and freer from propolis, and a laying queen cannot get into our sections and spoil them by depositing brood in them. Young, unmated queens can generally get through the zinc spaces quite easily, and instances have occurred, in our own apiary, of a young queen having mated, going into the super through the zinc spaces, but remaining there became too large to return, and made her brood nest in the super.

RAISING QUEENS IN FULL STOCK.—Some American beekeepers have been experimenting on raising several queens in one stock, having at the same time a laying queen brood rearing in the same hive. This is done by a special arrangement of the hive, with *double division boards* of zinc perforated to allow of the passage of worker bees, but of neither fertile or unfertilised queens. Many early experiments were failures, because only a single division board of perforated zinc was used, through which the queens could detect each other's presence, but it is stated that when double divisions of zinc, with a quarter of an inch interspace, were used, young queens were reared and hatched continuously, in a full working colony. Of course they were removed to nuclei, or other hives for mating as they were hatched.

The advantages of this method are that instead of a separate hive or nucleus for each queen cell, we have our populous colony divided under one roof, economizing the necessary warmth. The bees all have the same exit and entrance, and when queen-rearing hatching is over, the colony can at once be restored to a single stock by removing the division boards without any of the risk attendant on ordinary uniting. We see that some beekeepers prefer using unsealed or cup cells for queen-rearing in this manner. A queenless colony is kept for two or three days making cups for queen cells, all of these with eggs are cut out and placed in the divided hives to finish and rear, and no colony need be kept queenless for more than two days to obtain a considerable number of *queen cups*.

CHLOROFORM FOR BEES.—We have spoken of this subject in former numbers, and have read notices of the use of chloroform for quieting bees in recent foreign journals. We have never tried it ourselves, except once many years ago, when we thought we had killed all the bees in the stock, but they revived after about an hour's intoxication. A writer in the *British Bee Journal*, of September 12, states—"My experience (page 398).

OUR SWARMING TIME.—Our first swarm came out on September 27th., altogether we have had 12 go out, and all hived except one which escaped. Some swarms which came out on October 8th., and were easily hived swarmed out from their hives twice the same day, although each time placed in a fresh hive. The same swarms came out the next day and all three united, then separated; one swarm rising as if to depart settled on the ground and was housed again, as were also the other two. Next day the one that clustered on the ground swarmed out and went right away. This case was decidedly one of unusual excitement among the bees, induced, we believe, by the peculiar sultry and thundery weather prevailing at the time.

MODIFIED BERLEPSCH HIVE.—A beekeeper who has had more success with deep-framed hives like the Berlepsch last year, than with the Langstroth, constructed some with frames nearly the same dimensions as of that kind, only with the frames to lift out as in the Langstroth instead of drawing out at the back as in the true Berlepsch. The frames also are made to carry the ordinary sized sections—that is, they are 8½ inches wide by 12½ deep inside. He informs us that all his stocks in such hives gave him a larger surplus last autumn, wintered better, and are earlier and stronger this spring than any of his stocks in Langstroth hives, and that he is now arranging to adopt that form of hive altogether.

We have two or three of these hives made by the Beekeepers' Supply Company, now occupied by this season's swarms, and hope to have as favorable an account to give as our informant at the end of the honey harvest.

Original Contributions.

HOW I TOOK MY FIRST SWARM.

One of the pleasures I had looked forward to in removing from the metropolis to a country town, and especially such a place for blossoms and white clover as Daylesford, was that I should be able to have a few swarms of bees. The botanical gardens, which are our great pride in these parts, and which are a perfect picture in spring, summer, and autumn, are but half a minute, or at any rate not more than a minute from our own orchard as a bee would take the journey. So I thought there would be a grand honey field for the busy workers; but an experienced beekeeper here tells me that the immense quantity of white clover, which grows everywhere within the Borough of Daylesford, produces no honey, and therefore has no attractions for the bee. He attributes this fact (for fact it appears to be, I, myself, since my conversation with him, having observed that the bees hardly ever touch the white clover) to our elevation above the sea level, viz., 2000 feet or more.

I should think, however, that it is a question worth considering, as to whether white clover growing from 2000 to 2200 feet above the level of the sea is honeyless, and if so, why?

Well I had a very nice colony bived in a brandy case, given me by a farmer living a few miles away the season before last. It was brought in the autumn, and I could tell by the weight that there were plenty of stores inside for the cold season of the year, so that I was only concerned as the winter came on about keeping them warm and dry. This I did by getting a case large enough to tip the hive into, and as there was a space of about six inches at each end, I stuffed it with straw, consequently they did very well.

When the spring came and the warm weather was upon us, I made every preparation. I had purchased some hives from Mr. Chambers' factory, one already put together for a model, and three others in the flat, and being a little bit of a carpenter I had no difficulty in putting them up.

I also built a honey house at the further end of the garden, so that I could place hives, &c., under cover, and as I expected more than one swarm I prepared a square, with a broad path on each side, upon which I could arrange the hives, while in the centre I planted thirty golden raspberry canes, which grew and flourished very well, and afforded lots of nectar to the bees, as well as fruit for ourselves.

I had an old straw hat that I did not generally use, and the good wife sowed a green veil round the brim, and with an old pair of diving gloves, I considered myself fairly equipped for every emergency. I need hardly say I had also furnished myself with a Bingham smoker. It had no guard to it, and I was speedily reminded of that fact, for as the books tell you that there is some art in keeping the smoker going when it

is once lighted, so that the amateur may not find it dead out when he most needs it, I was anxious to get into the way of its use. It was not until I had burnt my fingers pretty severely again and again that I learnt to remember that the tin was hot, but the wood was not, and so to take hold of the bellows. I found a bit of stringy bark, pulled fine like flax, answer as well as anything, so I got a hundle and put it on the shelf in the honey house.

But I must not forget one thing more I prepared for the coming event. I noticed in the A B C Guide the woodcut of a swarming box, with a long handle, the box being pierced with holes all over, so that the swarm being shaken into it, as it was held up under the branch, would take to it at once, and begin to crawl in and out of the holes. Well I set to work with the thin wood of a kerosene case, and made this swarming box, and had it all ready.

I did not forget to provide a large sheet of brown paper, and considered myself fortunate in getting a waterproof sheet, so that it was stronger than ordinary paper. This of course was to dump the bees upon when I had them in my long-handled hiving box.

I had pretty well got by heart the instructions given in the books, which were somewhat to this effect—"When the swarm has settled on a branch, take your hiving box, hold it up close underneath, give the branch a sharp shock, and the swarm will fall into your box; then carry it to the empty hive, in front of which have your sheet spread in such a way that the bees dumped upon it can easily run in. If they are reluctant to move give them a puff of smoke, and that will quicken their pace, and if the front of the hive is raised by a couple of little wedges, about half an inch or so, they will soon begin to stream in. When they are in, cover your hive with a sheet, let the bees settle, and they will as a rule give you little or no more trouble." This, at any rate, was how I got hold of the gist of the matter from reading, for up to this time I had had little or no experience with bees, except indeed on three not to be forgotten occasions, the first two being when I was a boy. Boys are cruel scamps, and though I am a parson I was not a whit better than the rest.

We used in those old days to catch a bee, extract the sting, then take out the honey bag and enjoy the sweet nectar. On one occasion I placed the sting, which I had squeezed out and removed from its sheath, with nothing but the root attached to it on its side on the back of my hand, and immediately before my eyes it turned up and went into the flesh, as if it had been driven by the bee, and stung me.

I mentioned it to the boys, who were with me at the time, and wanted to try it upon them, but they did not see it, and I have never ventured upon the experiment with myself since that time.

The next experience was a sting on the tip of the tongue, while I and one or two more were eating the tit bits of comb honey as a bigger boy

was getting it from a hollow log, after having smothered the swarm with sulphur fumes.

And the third was a severe sting on the eye by an angry little worker, whose home I had disturbed in the winter in a neighbour's garden, for as the few bees I found in the cold weather were torpid, I concluded there were none in the hive, and so boldly approached and uncovered it in the summer, with the painful result already mentioned.

Well having everything ready, and after many false promises upon the part of my colony hived in the brandy case, one hot day, about noon, as I was talking with the verger of the church up by the honey house, out came the swarm I had been expecting so long. Out they came in a continuous stream, and went circling and buzzing round and round, and at last to our great delight they settled upon the branch of a neighboring pear tree, about ten feet from the ground, hanging in a wedge-shaped mass.

I soon had my paper sheet spread in front of the hive, and got a big step ladder I had handy, and placed underneath the tree. In my excitement I did not put on my hat, veil, and gloves, but remembered to get my smoker ready, and my hiving box out.

The Verger who had plenty of nerve, got up the ladder to shake the branch while I held the long-handled box. While doing this a bee lit on my face, but I thought it best to take no notice, so it quietly crawled all over my face until it had satisfied its curiosity, and completed its investigations, and then went off without doing any stinging. The Verger only got one sting while detaching some portion of the clump with his finger, and I got none.

Having shaken the bulk of the swarm into my hiving box, I carried them off to the hive and dumped them on to the paper in front, and as they were rather slow to move in the right direction, viz. :—towards the entrance. I gave them a puff or two with my smoker, when, to my great disappointment, they all rose in a body and flew back to the pear tree again. I then noticed for the first time that I had forgotten to put the little wedges in to raise the entrance half an inch or more. I remedied this at once, and then got a saw and a large crumb cloth which I used to keep the dust off the buggy. So we set quietly to work and sawed off the branch below where the swarm hung on, and carried it and placed it on the paper in front of the hive, covering it, hive and all, with the crumb cloth. I presently started the bees with a puff or two of smoke, and they soon began to run in, so that in about an hour or an hour and a half they were all safely hived, and I was able to remove the cloth.

I had, according to directions, put a sheet of brown paper over the frames to prevent the bees coming up and building in the roof. At the end of six days I examined my new swarm. I found they had eaten a hole through the paper about two inches long and half an inch wide, but had not built above, having set to work upon two frames in the right-hand corner of the hive as I stood over it from behind. I put a thin sacking

mat, such as bran bags are made of, on the frames in place of the paper, and shut them up again. I did not attempt to take any honey from the hive during the season as I wanted them to fill the two frames and lay in plenty of winter stores; this they did, for when I examined them in the autumn the whole two frames were heavy with honey. I have looked carefully over each frame of comb during the summer for the queen, but have not been able to detect her, although I know by the eggs and grubs that they must have a good queen among them.

I don't intend to touch the home below, as I have the super and section boxes all ready for this season, and shall do what I can when I see there is a good supply in the hive to induce them to work among the sections.

I did not get more than one swarm from the brandy case last season, although again and again it appeared as if another swarm was coming. We kept a pretty close watch, but still one or two might have got away. Nor have I transferred the colony from the brandy case to a frame hive, although I thought about it again and again last season. It appears to me, however, a much more formidable and risky undertaking to transfer than to hive a new swarm.

I notice in front of the hive of my new swarm on the ground about a couple of hundred dead bees, and in front of the brandy case about a hundred. The brandy case being kept warmer through having another box over it and the sides stuffed with straw, I have wondered if it was this provision for the winter that lessened the mortality. I took the precaution, however, to make and put on the top of the frame hive a fine large wooden covering to protect the roof from rain, although I did nothing to protect the sides from cold.

I have used neither veil nor gloves since I took my first swarm, and have received but one solitary sting, although I have examined the colony many times, taking up frame after frame. On my last experiment, however, just before the winter, I noticed that two or three of the left-hand side frames at the end of the hive had been stuck together by the bees. I did not disturb the arrangement, but I should like to know how best to get them asunder with the least injury to the bees, the comb, and myself.

B. RHODDA,

VICARAGE, DAYLESFORD.

Correspondence.

To the Editor of the Australian Bee-keepers' Journal.

SIR,—In reference to the worthy criticism you put my article under, I feel grieved to find that I differ from you in some respects, and I believe justly. With your kind permission I will vindicate these points in question, as perhaps in this instance the more there is said the better.

I was unaware of having advocated the Berlepsch hive, and the particular method of management, and what about it if I did? Fortunately this hive finds quite enough supporters without advocacy. That I drew notice to it in my article on the "Fertility of Queens" was a matter of absolute necessity to complete the said article. You in support of your criticism say—Your apiary is surrounded by a great variety of pines, which supplied the propolis nuisance that it became an impossibility to move the frames; but you did not tell us how long it took the bees to gather that full pound of propolis, how often you opened and examined that hive in the brood chamber, and how solid it was when you tried to tear the frames out piecemeal. If Australia was not poor in regard to pines, and if there were not many pines in the Parramatta Park I might begin to believe that my hive is not suitable for the intended purpose, at least where there are pines growing, but as it is your argument is a weak one.

Mr. Shallard informs us that his "frames run across the entrance, which is much the best for several reasons" he says. I am glad to hear it, as it was I who told him so about three years ago, and others have adopted the same plan through my advice, which suits them better than the length way.

On syrup feeding you think my objections not altogether reasonable. Why not, please? If you agree with me that if honey is obtainable it is better than syrup. Then I don't see where my unreasonableness comes in. You would as "soon give them arsenic as bought honey, the origin of which you know nothing." Well I fear you will not have many followers in that direction. I, for one, stand back. I would heat such honey, which would kill all the microbes, if any. Altogether I do not even advise buying honey for feeding. I desire the beekeeper to manage his bees in such a manner that feeding is not necessary at all, or if one hive is short of stores, then another must have surplus, which may be used as required. If the bees won't live without a syrup pot always boiling, let them die, and get such bees that will live without syrup. Yes in the present days, when bees are kept for profit, it behoves one not to spend money on sugar. And if they fall into the hands of anyone who sells their honey because it is worth 6d. to him, and the sugar costs him only 2d., rest assured he counts without the master. As every labourer is worth his wages so ought the bees to have honey, regardless of what is the usage in England and America by most large beekeepers. Mostly it is the beekeeper's fault if he has to feed. He wants to have a large number of stocks in no time, and increases to such an extent that there are no bees left to spare for honey gathering. Now I desire to prevent such extravagances, and if my advice be adopted then they can do without syrup, and they become good beekeepers. When I had only a few stocks, and knew little about bees and their habits, I was taught how to make artificial swarms. I did it, too, and had soon all weaklies, and they wanted feeding.

Well at first I bought honey at 1s. a pound, and the bees prospered, but as that became expensive I then bought sugar at 6d. and 5d. a pound, and then the bees got pitifully sick, and I lost several stocks altogether, after spending money and labour; but I had learned a lesson. Next year and henceforth I increased only moderately, and lo! the bees remained healthy. I need not feed and lost none. Others besides me have done likewise, and I am sure it is a good plan.

I quite admit that feeding on syrup to keep the bees alive does not mean feeding to give them a surplus, but it is possible nevertheless, and suspicions were brought under my notice at different times of such trickery; but I have not taken the trouble to ascertain the truth or otherwise of such information, and I still believe that it is safer not to feed syrup than to risk the reputation, as honey is very cheap in Australia.

W. ABRAM,
Italian Bee Farm.

Parramatta (N.S.W.) Oct. 21, 1889.

HONEY PRODUCING TREES OF GIPPS-LAND.

The chief honey plants and trees are the gums, wattles, sassafras, blackwood and wild willow. The white gum is the best honey producing tree here; it flowers nearly every year, and nearly all the year round, and secretes large quantities of honey. The messmate comes next to the gum; it flowers in the months of January and February, and has a large white blossom which grows well above the foliage. The honey from it is not so good as the gum; it is of a darker colour, and has not the nice flavour of the white gum. The ironbark also produces large quantities of honey. Some years it comes into flower in November. The honey from this tree is very dark, but very good. There is also a large amount of peppermint gum here, which comes into flower about Christmas, and some years flowers very heavily. The honey from this tree is of excellent quality, it being fine and clear and of splendid flavour. The sassafras also secretes a fair amount of honey; being in flower now, it is just a nice time for brood rearing, which is now in full swing. I find that the wattle and wild willow yield a small amount of honey, but a good amount of pollen. There are also a large amount of other shrubs that the bees work on. The Christmas tree is the best of the shrubs; it comes in flower in December, and yields a fair amount of honey. I started with Langstroth hives, but I found them too large, so I am now using my hives two inches shorter, with the entrance at the side. I find that this size is the best, as the bottom box is always filled with brood in the breeding season, and they are kept warmer in winter, and you have no need of extracting from the brood combs.

ROBERT HASTINGS.

Glen Hastings, Buln Buln, Sept. 2, 1889.

MODERN BEEKEEPING.

A HANDBOOK FOR COTTAGERS.

(Continued from Page 156.)

XI.—MARKETING HONEY.

A glance at the grocers' shops, filled as they now are with the various preserved foods, will show at once how important it is that everything offered for sale should have an attractive appearance. Many have complained that they could not dispose of their honey, but their difficulty commonly arises from the uninviting form which their surplus presents to the eye. Neat white glass jars to hold 1 lb. of honey may be obtained at from 15s. per gross, and larger ones in proportion.

Full honeycomb in the ordinary, old-fashioned supers suffers another disadvantage which often hinders the producer from finding a purchaser. It cannot be sent about safely by railway or carriers, but the filled section-boxes of the last chapter, when packed in crates, will bear uninjured all the dangers of a long journey, if only ordinary care be exercised. It is easy, then, for us to send our sections to the different honey fairs so frequently held; but, even at these, if we would find purchasers, neatness must be attended to. All wax and propolis found on the edges and bottoms of the sections must be carefully scraped off, taking care not to bruise the comb in so doing. The best sections should be placed in crates by themselves, and a full price demanded for them, the discoloured ones and those not quite sealed over being sold at a lower price. The demand for honey is rapidly increasing, and at the various shows that which presents the neatest appearance generally finds a ready sale. The Association uses its best endeavours to find for its members a market for their honey.

Inferior qualities should not be offered for sale, but rather given back to the bees. Inferior honey, however, will not trouble the worker with frame-hives; as if he take honey from combs in which brood has been raised, it will be done by the extractor, and it will be quite free from contamination. The skep or box it is that so mingles brood and store as to make much honey useless that would otherwise be marketable; but besides this, much of the honey taken from straw skeps and boxes is spoiled by the manner of taking it, even when the bee-keeper has grown wise enough to see the waste of killing his bees, and tainting his honey with sulphur, the common habit being to cut and crush all the comb together, straining and even wringing the enclosed mass through a cloth, defiling the honey with all the impurities of the hive. The combs being cut from the hive should be carefully sorted, all having brood being laid aside. If the owner has a stock in a frame-hive, these pieces may be fitted into a frame, and given to it, that this brood may be preserved and hatched out (see Transferring), or they may

even be piled up edgewise, and put on the top of a skep (removing the feed-hole stopper), and covered with a bell-glass, when the bees will ascend and take care of them. The remaining combs should be uncapped with a knife, and then cut up into strips, placed in a piece of fine muslin, and hung up to drain. The mass may be turned about a few times, but never, except with combs containing no trace of pollen, may they be pressed or wrung. It will be found that nearly all the honey will run out, and the waste may be given to the bees, who will clear out every drop remaining; but in this due care must be taken lest robbing be started. This explanation is itself a condemnation of the skep if we compare it with the plans used with frame-hives.

XII.—ARTIFICIAL POLLEN.

It has been already said that bees when busy breeding return home with little coloured (generally orange or yellow) loads attached to their hind-legs. This is pollen, the fertilising dust gathered from flowers, which is stored in the combs to be afterwards consumed together with honey by the workers, and in their bodies transformed into a food to feed the young grubs. Without pollen or a substitute bees cannot raise brood, and when natural pollen is not to be obtained, the bees will gather and pack the flour of wheat, rye, peas, the last being in all respects the best. Place near the hives a tray into which the flour has been put, with a little chaff, sparingly sprinkled upon it, so as to conceal about half the flour from view, and the bees, attracted by a small piece of comb containing honey, will soon commence dusting themselves and collecting the flour into pellets precisely like those formed from natural pollen. Stocks that are being fed with syrup will more readily take this description of food. The effect of artificial pollen is great in promoting early breeding, and ought not to be neglected. Protect the trays, and expose in a sunny spot, the meal being renewed from time to time. It will only be collected when little pollen is to be had in the fields. From the beginning of March until the blossoms of the peaches or pears open, will be the most suitable time for this kind of feeding, but after a cool, wet summer it will greatly aid the effect of late autumn stimulation in promoting the raising of brood.

XIII.—TRANSFERRING.

It often happens that it is desired to transfer combs from a straw skep or box-hive to one with frames. And this may readily be done. We first drive all the bees, and proceed to cut out the combs. It will make our work simple if we divide the skep by cutting it down from top to bottom, in a line between the central combs. Having placed a piece of cloth smoothly on a board a little larger than the frames into which we are to transfer, we lay across it two tapes long enough to tie round the frames. The combs are placed over these, and cut and trimmed to fit into the frame, care being taken to keep the same side uppermost as

before the transfer. Drone-comb is rejected, while those unduly thickened are pared down. The tapes are now tied over the frames, and the board with all upon it lifted to an upright position. The frame is now taken by its projecting ends and placed in the hive. The remainder of the combs are treated in the same way, till all the useful parts are fitted in. If the comb is not deep enough to reach the bottom bar of the frame, place a lath beneath it, pass a thin tape under the lath, and tie over the top bar, or wedge the lath up by a few corks. Keep the brood combs together in centre of the hive. The hive is now taken to the stand which the skep occupied, where the forced swarm of course now is. This is hived in one of the ways explained under Natural Swarming.

The bees will quickly repair the combs if fed a little, and fix them in, and, generally, in a couple of days the tapes may be removed.

It is safer for a novice to cut the tapes across while the frames remain in the hive after being sure that the combs are fixed, then, with very little risk, they can be gently drawn out. If left the bees will, at the expense of much labour, eventually remove them, but it is always better to spare them this trouble.

The experienced may transfer almost at any season with success, but the learner should not attempt it before April or after September. Transferred bees will be much assisted if their new hive is contracted by a division-board, more space being given them as they are able to occupy it. Before transferring, consult the next chapter.

XIV.—GUIDES AND COMB FOUNDATION.

Frame-hives lose their advantages if the combs are built in an irregular manner. To prevent this, guides of various kinds are used. For the stock, straight, tough comb may be cut into strips and fixed by melted wax, or glue, to the top bar; or, we can give the workers a line of wax from which their comb will be commenced.

Sheets of wax are now made and impressed, in a machine, with the forms of the bottom of the cells. These sheets are known as "Comb Foundation," and are of immense service. If fixed in the frames with due precaution, they are quickly converted into combs of perfect flatness, and all of worker cells.

Foundation is generally used in strips of one or two inches wide only, and more than this should not be attempted at first. For fixing them, the wood slip just described may be put into position, and against the face of it the strip is placed, and melted wax poured down in drops on the line where it touches the top bar. For holding these strips or wide pieces of foundation during the time of fixing, nothing is so convenient as a board fitting loosely into the frame, and prevented from passing more than half-way through it by brads driven into its top and bottom edges.

In the same way, foundation may be used for guides for section-boxes; but a special thin kind is made for these. Of the thick foundation, not more than $\frac{1}{4}$ in. in depth should be

given as a starter in the super, otherwise the comb would have in it a course mid-rib of wax which would practically spoil it. Pieces of perfectly clean comb may be used in section-boxes, if preferred.

Where narrow strips of foundation are used the bees will build downwards in the natural way, but where large sheets are employed they generally build from the bottom before the top has been strengthened, and thus often cause the foundation to break away from the frame. This may be obviated by using very stout foundation and giving additional strength at the top by an extra quantity of melted wax, or by using wired frames.

QUEEN-CELLS ABOVE PERFORATED HONEY-BOARDS.

ALSO SOMETHING IN REGARD TO FRIEND DOOLITTLE'S NEW BOOK.

Any one would suppose, Mr. Editor, by your foot-notes at the end of J. D. Fooshe's article, page 490, that you must have read my new book on queen-rearing rather carelessly, for in it I tell that queen cells will be completed when placed over a populous colony at any time of year when the bees of any colony are sufficient to enter such upper story, as to their numbers, where there is a queen-excluder between upper and lower stories. You seem to think that the swarming fever has something to do with the matter; but such is not the case, as I have proven for years, and especially so during the past three or four weeks of scarcity of honey, during which bees have been on the verge of starvation, yet in no case where I have put prepared cells above a queen-excluding honey-board have the bees failed to carry out and complete the cells, perfecting them to the fullest extent, so that queens reared in such cells have come up to the highest type of perfection, even though the colony below were living only from "hand to mouth." The bees in the upper stories seem to be placed in the same condition, or at least feel that they are, as when they are about to supersede their queen on account of old age, in which case all are aware that bees will rear good queens no matter what time of year it is, or whether honey is coming in or not. In all of my six years' experience with the plan given in my book, I have never failed to have queen-cells completed when placed in an upper story over a queen-excluding honey-board (which plan is similar to that given by Mr. Fooshe), except late in the fall, when bees had gone into that quietude which they go into after the honey season is past. If we wish cells *then*, we must feed the bees so as to arouse them to activity, when they will complete queen-cells, so that as good queens will hatch from them as any which can be produced during the summer season, or in the height of the swarming season. I am not guessing at any of this, but speak it after a practical experience along this line for the past six years.

The plan as used by Mr. Fooshe, of getting the queen-cells under way before putting them in the upper story, is practically the Alley plan, as given in his book, which you in your headlines call "an improvement on Doolittle's plan." That just as good queens can be reared in this way as by the plan of making cells of wax, which I outlined, I have no doubt; but the objections to it are, 1. That one or more colonies must be kept queenless to start these cells, which the colony having an upper story on are to bring to completion. A queenless colony without brood, as he describes, is of no value in the apiary, as a honey-producer: while in the way I work, no colony is kept queenless a moment on account of queen-rearing, but all are at work in sections or for extracted honey, just the same as if I were not rearing any queens at all. 2. Mr. Fooshe has to cut his nice worker combs up into strips, on which the bees build the cells. Where one makes a business of rearing queens this is quite an item: for after we have our combs all perfect in our hives it is a pity to spoil them by cutting out long strips for queen-rearing. By making the wax cups, no combs need ever be cut, where the vision of the operator is good enough to see to the bottom of the cells to take the larva out in transferring. The third objection is the most serious to me of the whole; and that is, that by his plan the cells must be handled very carefully or else they are easily mashed; and in any event a piece of the strip of comb must accompany each cell when it is detached or separated from the bar of wood to which it was fastened, which hinders it (the cell) from being used successfully in the queen-cell protectors.

Again, unless he kills a part of the eggs or larvæ with a match, as does Alley, he will have many cells built together, so that a part must be destroyed in separating them. By using the wax cups, the cells, when completed, can be picked off the stick where they were built, about as you would pick peas from a pod, while the base of them is sufficiently stout so that the queen-cells can be pressed into the combs of queenless colonies so they will be a fixture wherever you wish them, thus saving the cutting of combs in placing the cells in the hives as we used to do, and as is pictured out in many of our books.

In nearly all of the comments on my book, I see many suppose that the book was written for queen-breeders, who follow the rearing of queens as a business; but this is a mistake. The book was written for the sole purpose of benefiting *all* in the bee-business, from the man who counts his colonies by the thousand down to the amateur who has but two or three. All parties want queens for any case of emergency which may come up, or for the purpose of superseding those which are past their usefulness, or are not of the "blood" which they wish, or to give to the parent colony after the old queen has gone out with the swarm, so that second swarming may be prevented. How handy it is, then, to rear such queens in an upper story, get them fertilized in the same by slipping in a perforated

zinc partition so as to inclose a comb or two on each end of the hive, from which the queen may issue to meet the drone, and, after returning, be kept laying here till she is wanted for use, thereby aiding the queen below with brood all the time she is being held before she is wanted for use! The possibilities which are before us along the line which this perforated metal may bring us, have only begun to dawn upon us. Queens can be reared and fertilized by the thousands in any apiary, and yet no colony be kept queenless for a single moment, nor any nuclei made, but all work in the apiary be going on just the same as if no queens were being reared. The advent of the perforated metal is likely to mark an epoch in our history, fully equal to that of the honey-extractor, movable-comb hive, or any thing of the kind.

Borodino, N.Y.

G. M. DOOLITTLE.

Friend D., I shall have to own up, and beg pardon. It is true, I have not, or had not until this morning, June 26, looked at your book more than to turn over the pages a little and look at the pictures. The reason is, that I am already overworked on reading things that I *must* read; but I now find that it would have been far better had I neglected some other things, and given your book the careful attention it deserves. When Ernest made his review notice, he read the first six chapters; but I now see that he did not get to the most important matter in the book at all. I want to say to our readers, that friend Doolittle's book is as interesting, at least to me, as any thing I have every read in regard to bees, hardly excepting father Langstroth's book when I first got hold of it. One reason is, that it is right along on a line where I worked for months, several years ago. I experimented by placing wire cloth between the upper and lower stories. Perforated zinc was not then known—at least I had not at my command any thing to permit the worker-bees to go above and hold back the drones and queen; therefore my experiments amounted to but little more than having queens raised in nuclei above, in strong colonies. These nuclei were either shut off entirely by wire cloth, or else these drones and queen had free access to the upper story. By having upper entrances, I succeeded in getting queen-cells built and queens fertilized to some extent; but it did not pay, and I was continually annoyed by being obliged to disturb the nucleus every time I wished to get into the lower story of the parent colony. This latter point, if I understand, is still an objection to Doolittle's method. I do not know whether friend Fooshee had read friend Doolittle's book when he wrote or not; but it is true, that the whole plan is given in very full details in chapter 7 of Doolittle's book. In chapter 13 we are told how to get queens fertilized in the same hive where there is a laying queen. These two chapters are certainly worth the price of the book to any bee-keeper. In fact, it seems to me that every man, woman or child at all interested in bees, ought to read friend Doolittle's book. The accounts of his discoveries read like

a book of fiction. In fact, it sounds to me in some parts like the Arabian Nights; and yet it is absolutely true, every word of it. You can verify it yourself with your own bees. I know it, because I have experimented all along in the same line. Those who are unfamiliar with this intricate, complicated, and wonderful matter of securing queens from an egg that would, in the usual course of events, have produced a worker-bee, will become familiar with the matter by reading friend Doolittle's story. The whole of it seems to have been written in friend Doolittle's happiest vein. I should judge that he had given the book great care and pains; and I believe that is the way he usually does everything. One reason why I did not give the book more attention, I supposed it was a good deal a summing-up of what had already given in the journals. But a great part of the book contains information that has never been in print before, that I know of. Of course, it will be more interesting to those who raise queens largely than to those whose business is mostly honey-raising, and who, for the most part, let the queens raise themselves. It seems to me, however, that we can all of us smile a little when we read the book, to think how often its author talks about "nature" and nature's methods. Why, the plan he gives is the most unnatural, and there is more tinkering with nature, than in anything that has ever before been written, and yet his methods are in perfect harmony with the natural instincts of the bees.—*Gleanings in Bee Culture.*

Extracts.

BEEKEEPING IN UTAH.

FURTHER FACTS IN REGARD TO THE TERRITORY AS A HONEY COUNTRY.

Beekeeping in Utah, as far as I have been able to judge, differs but little from beekeeping elsewhere. The hives and fixtures are about the same, while the pasturage seems to be more sure than in most places. We almost always get some surplus, and it is generally through extracting too close that we have to feed. Of course the crop varies with the season. If we have a dry season, and sweet clover is not so abundant, we have a light crop.

The hives used are of various patterns and dimensions. The Kidder predominates among the farmers and those not considered to be practical beekeepers; while among good beekeepers the Simplicity, Heddon, and what we call here the "Short Langstroth," or a frame that fits crosswise of a ten-frame Simplicity, is used.

The bees are a cross between the black and Italian, with a predominance of about two-thirds in favour of the latter, although we have had importations of other races at different times. Our best honey gatherers are generally those that are considered a trifle cross.

Comb foundation plays a very prominent part here among practical beekeepers.

The sources of honey are various, the most prominent of which, as I have before stated, being sweet clover, while the bees gather considerable from fruit-blossoms, alfalfa, wild flowers, &c. The surplus-honey flow does not generally commence until sweet clover bloom, which begins about the first of July; and in most seasons it continues until the first of September, although the bees generally gather enough to live upon from the middle of April until late in October.

In a dry season we do not have to wait for the honey to get sealed, as it is pretty thick when gathered, therefore we can extract, generally, when the frames are full, which, in dry seasons is about every ten days. In moist seasons, which, by the way, are very rare, we have to let the honey get about a third capped. The honey taken in the above way candies in a very few weeks, and becomes very solid. It is then (with us) in a very good condition for shipping.

Comb honey is handled much in the same way as in other places. The T super seems to be, all things considered, the best adapted to our system of management.

In handling bees during the season, the minor points in management are as many (if not more) as the beekeepers, while the main points are about as follows:

Along in March or April, according to the season, the hives get a thorough cleaning; all dead bees, dirt, broken combs, &c., are removed; the hives are straightened up, and the litter, &c., is raked up and carried away from around the hives; and if any bees are without stores, full frames from those that have plenty are given them.

In May, queen rearing and dividing claim our attention. In June, the stocks are all built up, and everything is put in readiness for the honey flow; the supers are put on the last week in June or the first of July. In about two weeks extracting commences, and keeps on until the last of August, when the surplus-honey flow generally ceases. The supers are left on until about the first of October, to catch any surplus that might be stored, then they are taken off and the bees are packed for winter.

Bees are generally wintered in single-walled hives on summer stands, although chaff hives are used. Some give their bees considerable protection, while others consider it unnecessary.

The honey-market here is not the best in the world, as there are by far too many small producers; but I am happy to say that their ranks are weakening. Fruit-growers here look on bees as their friends, while the bee is considered the emblem of Utah. We hear very little about adulteration of honey, as it will not pay.

We have considerable trouble with foul brood, which is generally found in old tumble-down Kidder hives, but very seldom found in a well-kept apiary. In fact, I have never seen the disease, except in neglected apiaries. The foremost beekeepers of Utah are young men, and you may hear of something from us in the way of beekeeping, in the near future; but be that as it

may, beekeeping in Utah has come to stay, and I predict that in a very few years, it will be quite a source of revenue to the territory.

J. C. SWANER.

Salt Lake City, Utah, Jan. 24, 1889.

FOUL BROOD AND ITS CURE.

[2249.] In my last I gave an account how far I had proceeded with the experiment in connexion with the cure of 'foul brood,' and also its attempted propagation in other colonies. I think it will be interesting, and perhaps advisable, to give to bee-keepers some little idea as to what formic acid is. To begin with, it is an acid about which very little is known by scientists in comparison to the bulk of other acids. So little is it used that if we go to a retail chemist and ask for a pound (about a pint and a quarter) not one in five hundred would have it in stock, or perhaps any, and are almost sure to express surprise at your wants. Natural formic acid is an organic acid produced by macerating red ants in water; but the acid used in my experiments is commercial formic acid, artificially produced by heating an equal quantity of oxalic acid and glycerine to a temperature of from 212° F. to 220° F. fifteen hours and distilling with water. The formic acid slowly passes over, the glycerine being regenerated. Glycerine is derived from fats; oxalic acid from sawdust or sugar by the action of nitric or sulphuric acids. It may also be instructively prepared by the oxidation of methylic alcohol. It is not what is termed volatile, that is, giving off a vapour at a temperature of 60° F. The specific gravity of the acid used in my experiments was about 1.060; this I am not quite certain about, but will obtain the precise gravity later on. Its formula is H C H O_2 .

At the strength given formic acid is a very simple and innocuous remedy, causing no ill effects if spilt on hands. In taste it is simply acid, with a rather pungent flavor. I may say that I have placed some on my tongue without the slightest damage to that member, so that beekeepers need be in no fear of injuring the skin of the hands if spilt on them. I mention this, as, in a letter to a contemporary, a well-known beekeeper has issued a warning, cautioning bee-keepers against using, as he there terms it, 'the most dangerous remedy of the three,' viz. salicylic acid, phenol, and the foregoing. This idea has arisen from a mistake in the description of the strength of acid used. Concentrated formic acid blisters the skin and causes sores which are very difficult to heal. The difference in price of concentrated and commercial formic acid is so considerable that there need be little fear of the wrong strength being used; the concentrated being four times the price of the commercial form.

We now come to the means I used in the administration and preparation of the cure. One of the principal items, about which I have received the most numerous inquiries, is my ad-

dition of zinc to the acid. What does it do? Upon the addition of zinc hydrogen is given off in quantities, which carries with it infinitesimal quantities of the formic acid through the hive, not perceptible to the sight. This can be proved by placing a little of the acid upon a piece of highly polished zinc, and causing a very mild, continuous current of air to pass over same in one given direction for an hour. A mark will be made upon the plate, speaking nautically, from windward to leeward of the acid caused by these particles of acid being carried along its surface with the hydrogen, and acting upon the highly polished surface; in other words, the addition of the zinc causes a more rapid and thorough evaporation of the acid, as formic acid, as I have said before, will not give off vapour at 60° F. Whether the addition of the zinc caused the marked improvement in the health of the colony I must leave for future completion of experiments now on hand.

There is one most important point to be considered in these experiments. You will remember that I commenced to treat No. 1 colony from seven to eight weeks ago, at this time they had varying of sealed honey in each comb gathered and stored while the hive was in a diseased condition; now each of these cell-fulls of honey I looked upon as so much 'bottled-up foul brood,' and from a subsequent experiment I find that I was quite right in my surmise. I have, after curing the colony, again infected it from itself. Directly after my last examination I uncapped nearly all the honey-cells on top of combs and smeared a quantity of the honey scraped therefrom well over the floor-board at the back of the division-board; it was not long before the bees swarmed from under the division-board and cleared it all away; with this they, as I supposed they would and wanted them so to do, fed several of the larvæ upon, with the result that upon my next examination to-day (seven days after) several of the larvæ are dead with 'foul brood,' and two cells had dead (foul) larvæ in them. These two cells I disinfected by placing in them a straw dipped in formic acid, and marked such cells for future reference. I have now again applied the vaporiser to this hive, and will publish results.

The bad weather and want of time have prevented a thorough examination of the other colonies under experiment, so I will leave these for a future issue, feeling more and more confident of the future success of this remedy.

In my own mind I do not believe that this cure will simply be confined to formic acid. I have an idea that other acids, such as sulphuric oxalate, will have an equal, if not better effect. Of this later accounts shall be published.

I should wish that a few bee-keepers who have 'foul brood' in their colonies, and who are willing to follow to the letter definite instructions given, would communicate with me that a much larger number of colonies may be under treatment at one time: in point of fact I cannot give the time, neither have I the inclination, to treat a dozen or so of colonies. I have one

gentleman's promise to do so, and I think that, say, two more would be sufficient, but they must agree not to deviate from the path laid down one iota, and also be willing to compare notes. I will provide two such with the gutta-percha troughs together with sufficient formic acid for one colony free of expense.—*British Bee Journal*.

W. B. WEBSTER.

SWARMING.

THE THEORY OF ITS CAUSE, AND HOW IT MAY BE PREVENTED.

What causes the swarming spirit of a colony? is a question not fully answered as yet. I will hereby give my theory, and I think it is as new as it is correct.

We know that, 21 days after the egg is laid by the queen, the young worker-bee will gnaw out of the cell. Two days later it commences to work, but inside of the hive only. About 16 days later she commences to gather pollen and honey. In summer time the worker bee will generally be dead 27 days after the first flight; so we see that the proportion of brood, house-bees, and field-bees, is 23 to 16 to 27, in the normal state of a colony. Of course, this is correct only if the queen has laid the same number of eggs daily for some time. In early spring, when breeding commences, no house-bees are in the hive, and the older bees have to do their work. The amount of brood is by and by increased, and the proportion of brood to house-bees gets gradually nearer to the normal condition. As soon as the queen has laid, for more than 23 days, as many eggs as she possibly can, we have the normal condition, and the colony is on its highest point of prosperity. The growing number of honey-gatherers has meantime filled the empty cells of the hive partially with honey, and consequently the number of eggs daily laid by the queen is by and by decreasing.

It makes no difference whether the greatest number of eggs laid by the queen is attributable to her fertility, or to the room in the hive devoted to breeding, or whether the number of eggs laid is, later on, decreasing from any other cause; we always have the fact that hereby a surplus of house-bees is in the hive at a certain time, because more young bees will come from the cells as the queen lays eggs. These young bees are desirous of feeding larvæ, but not all of them can possibly do so; and this condition of a colony starts the swarming impulse. The desire of young bees for more brood causes it. As much as possible, prepared food is given to the queen, and so she is induced to lay eggs in the started queen-cells, and a swarm is the consequence.

This theory explains every cause of swarming coming to my notice, and the different ways by which swarming can be prevented to a certain degree. We know of

DIFFERENT WAYS TO PREVENT SWARMING.

1. If we remove some capped brood at the right time, and put empty combs, or, still better, foundation, into the brood-nest, we induce the queen to lay more eggs; consequently the house-bees have more work to do, and the surplus of house-bees disappears. The next day fewer young bees will gnaw out of the cells, and the house-bees get less again, relatively to the brood. So this is a very good preventive of the swarming fever till the former condition of things reappears.

2. If we take some bees from a colony we get mostly house-bees, because the field-bees go back to the colony. So this will prevent swarming for some days.

3. If we give to the house-bees more work to do, we can prevent swarming; so by cooling the inside of the hive. Then more bees are necessary to cluster on the brood, and swarming may be prevented for some time.

4. But the house-bees are the comb-builders too. If we give them occasion to build new combs near the brood-nest, swarming may be prevented in most cases, especially if the bees build combs for the purpose, that the queen may lay some eggs in them (Simmons' method). These combs are clear profit to the bee-keeper. Why, I will show presently.

5. If we work our colony for extracted honey, and extract the honey from the combs in such a way that the queen always has plenty of empty cells, we shall have no surplus of house-bees, and swarming can be prevented. But we have to consider here, that a very strong colony needs relatively fewer brood-bees than a weaker one, so a strong colony may have a surplus of house-bees, if the proportion of brood to house-bees is even not smaller than 23 to 16. So a very strong colony may swarm nevertheless, while a weaker one will not.

6. A moderate honey-flow which by and by crowds the brood, is just the thing to cause a surplus of house-bees, and so induces swarming. A very good honey-flow crowds, of course, the brood also; but the young bees will find plenty of work to do to prolong the cells, to cap the honey, and to evaporate the rapidly coming honey. Such a very good honey-flow gives plenty of work for young and old bees, and they pay very little attention to the brood.

I said that a surplus of house-bees will build combs at no cost to the bee-keeper. My theory is as follows:—All the young bees feed themselves plentifully with pollen and honey, for the purpose of feeding the young larvæ. If a surplus of brood-bees is in the hive, some of them will not find larvæ to be fed; the larval food, or chyle, accumulates in the stomach, and will go through the stomach-wall into the blood. A surplus of blood is just the condition by which wax is secreted; consequently a surplus of house-bees causes wax secretion. If room and the necessary temperature are in the hive, new combs will be built; if the bees have no room for this purpose they build brace-combs, or thick wax lumps, on the top-bars of the frames,

or they cap the honey twice as thick as usual. A newly hived swarm has no brood, consequently always a surplus of house-bees—at least the first eight days. In this time a swarm builds combs very rapidly, and at no cost to the bee-keeper, because this wax is secreted anyhow. We can observe this if we have a small swarm (especially an after-swarm) in a large hive, and the outside temperature is cool at night time, so that the cluster of the swarm is much contracted. We then find a great number of wax shreds on the bottom of the hive. This wax is secreted, but the bees can't use it, because the cluster is too small, and outside the temperature is too low to form that wax into cells. If we give empty combs only to a swarm, this secreted wax is formed into brace-combs and wax lumps. The proportion of field-bees to the brood and house-bees is important too, and I hope to write about it in another article.

L. STACHELHAUSEN.

Selma, Texas.

Your suggestions are much in the line with those of our friend Hasty and Dr. C. C. Miller, although you have carried them a little further. I have often noticed the waste of wax by way of droppings on the bottom-board, brace-combs, and little lumps scattered about the combs where they were not needed, and extra cappings to the cells, sometimes extra thickness to the walls of the cells; and I have many times been impressed by the fact that these bees, were an opportunity given them, would build combs at no expense to the bee-keeper. It is along in this line of reasoning that friends Doolittle and Hutchinson conclude that bees will produce more honey, where they are obliged to build a certain amount of comb, than where the combs are furnished them. Other experiments, however (but they may be under different circumstances), indicate exactly to the contrary.—*Gleanings in Bee Culture.*

UNSEALED BROOD.

TO PREVENT THE SWARMS FROM DECAMPING.

Written for the American Rural Home,
BY G. M. DOOLITTLE.

Will unsealed brood prevent swarms from decamping? is a question often asked, and one which is often answered in the affirmative. I claim that it will, under certain conditions, while under other conditions it is no preventative whatever, but, on the contrary, rather increases the tendency of swarms to decamp. Since this plan of giving unsealed brood—to make swarms stay in the hive in which they were put—was given to the public, I have closely watched the bee-papers for reports, and I find that more reports are given of swarms going away where brood is so given, than of those where the writer thought that the brood helped his swarms to stay in the hives that they were hived in.

Previous to 1871, I had never clipped any of my queens' wings, and I was often fearful that my new swarms might desert the hives that they were placed in. During the spring of that year, I read that a frame of unsealed brood placed in the hive at the time of hiving, was a sure preventive of a swarm's decamping. This was read with enthusiasm, as here was a plan by which my fears could be entirely removed. Consequently, when my first swarm issued, I hastened to get a frame of brood in all stages which also contained some honey to start them in house-keeping, as Elisha Gallup, that veteran bee-keeper, used to tell us that we should do.

They were hived about 2 p.m., and I went to bed that night feeling that my first swarm of the season was well provided for, and would be sure to stay. The next morning I took a look at them, and went into the field some distance from the house to work.

At about 9 o'clock, the cry, "Bees are swarming," was heard, and upon reaching the bee-yard, the new swarm was seen going for parts unknown. My lips were bit, as I thought of some appropriate words to say about the one who had recommended this plan, still I never put those words in print, although I thought the author of this plan of keeping swarms from absconding, deserved a good chastising.

I then resolved that in the future I would keep the wings of all my queens clipped, which was done without delay. Since that time I have often hived swarms, and given them brood by way of experience, and have also given brood to swarms made by dividing, and had many of them come out, but their queens could not fly, and so of course they could not abscond. Probably three-fourths of the swarms hived in this way have stayed and worked all right, yet not one in fifty hived in an empty hive has bothered me in attempting to leave, which proves that the brood was, on the whole, no preventive, but, on the contrary, an incentive for the bees to leave the hive.

But, says one, "Bees ought not to leave unsealed brood, as it is contrary to their nature to desert such." Let us look into this matter a little, and see if this claim is correct. When all prime or first swarms issue, they leave brood in all its stages in the parent hive, from which they came, whether contrary to their nature or not, and in giving the frame of brood to swarms having the old queen with them, we place them in exactly the same condition, as far as this frame of brood is concerned, in which they found themselves immediately before they swarmed. It is evident that the prime swarms issue because there is a prospect of more bees hatching than are needed to make a fairly prosperous colony, which, with the instinct that is implanted within them, "to multiply and replenish the earth," causes them to swarm. By giving them brood we place the hive in a similar condition to what the one was which they left for the purpose of getting away from those conditions. Is not this plain?

Upon examining hives with brood placed in them, from which a swarm had tried to decamp, I find that they will have two small pieces of comb built, one on each side of the frame of brood given, while queen-cells have been built upon the frame of brood in which the queen has deposited eggs; thus showing that they consider the conditions the same, or nearly so, as they were in the parent hive from which they had issued the day previous.

In these cases of desertion, there are nearly bees enough left to protect the brood in the frame, which also shows that they swarm under nearly the same impulse which was upon them when they first left their parental roof. This being the case, when is brood ever a preventive to swarms absconding? Swarms having virgin queens issue from a plurality of queens in the hive, and not because the hive is becoming over populous; besides, such swarms never leave any unsealed brood behind, without the interference of man. If, now, they have unsealed brood given them, it secures to them the means of rearing another queen, and as such swarms are always smaller than prime swarms, and the queen will not get to laying in nearly a week, this brood is to them a means of safeguard against accident when the queen goes out to be fertilized.

For the above reason it is always best to help such small colonies along a little whenever they are hived, for it not only prevents their leaving, and supplies a positive means of getting a queen (should the one they have be lost before she gets to laying), but the brood so given helps them to get to be a self-supporting colony much sooner than they otherwise would be; for the few thousand bees which will hatch out of this comb thus given, are a great help, coming as they do in a time when they are the most needed.

In the above we have the true secret of giving brood to swarms when hived, always giving such as have virgin queens' brood, and withholding it from those which have the old or laying queen. This lack of discrimination on the part of those who have recommended the plan, is what has caused much of the trouble in the past.—*American Bee Journal*.

Borodino, N. Y.

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AUSTRALIAN

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JANUARY, 1890.

[PRICE 6D.

Editorial.

BEE GOSSIP.

FOUL BROOD RAMPANT.—From all quarters in Victoria comes the same story, "disease among the bees," "bees all dying or dead." Experienced beekeepers on enquiry and examination find in almost every instance that the cause of the trouble is *Foul Brood* in its most destructive form. We hear of it in Gippsland, on the Murray, to the eastward, the westward, and also near home, it almost threatens the apicultural industry with destruction, and at all events calls for some decided and vigorous action.

The great difficulty in the matter is the ignorance existing among most box hive keepers as to the nature and danger of the disease, indeed as to its very existence. If the bees die off, they say it is "moth or something," and the depopulated hives with their remaining stores are left to be robbed by whatsoever bees may come, and carry pestilence broadcast to other apiaries, and to the homes of wild bees in the hollow trees.

In some cases we are sorry to hear that beekeepers losing their stocks by disease, refuse any help or interference on the part of expert apiculturists, saying "they have kept bees for twenty years, and don't want to be taught anything," and as an instance of another form this ignorance takes we would direct the attention of our readers to a letter from Mr. Webb, of Warragul in this issue. Now if an ignorant and obstinate sheep or cattle keeper were to get scab, pleuro-pneumonia, or anthrax among his stock, endangering the stock of his neighbours, he would be compelled by law to take steps to prevent the disease from spreading and would be made to pay for any damage done to other people's cattle or sheep. It is a pity that bees in this colony are not reckoned as stock, or that a special law has not been enacted to deal with this contagious disease in bees, as is the case in America and in our sister colony, South Australia. As things are at present we are helpless against the obstructive ignorance which meets us

at every turn, as insurmountable as in the case of the Chinaman at Warragul. We think beekeepers should meet together in various localities where the disease is rife and deal with the subject at once. In many cases a local combination would suffice to establish a disinfection of the district, and some kind of quarantine, but probably the most effective method would be a combination of all modern and intelligent beekeepers with the view of obtaining the enactment of some law to deal with the matter.

The question will arise as to what can be done by law, and how can any law of the kind be administered? As far as our opinion goes we are inclined to believe that a law empowering the formation of district beekeepers' protective associations, somewhat analogous to local boards of health, who shall be able to obtain power to cause to be examined, by appointed experts, any stocks of bees within their districts, either known or supposed to be affected with contagious disease, and where such disease is found to exist shall be empowered to call upon the owner to destroy, or submit for disinfection all such stocks of bees, and in case of refusal shall, if the existence of the disease be proved to the satisfaction of the local magistrates, obtain an order of the Court to destroy or disinfect all affected hives. Some such arrangement as this, we think, would be better than having travelling inspectors or other officers and would leave the putting the law in motion to those most interested in stamping out this very destructive disease.

One great objection to the enactment of new laws is the difficulty and often great cost of administering them, but the method we have suggested, we think, in a great measure overcomes these difficulties.

THE SEASON.—Although we received gloomy news from most parts of the country as to the scantiness of the early honey flow, more cheerful accounts are now coming in, and were it not for the unfortunate prevalence of foul brood it is quite likely we should have the pleasure of record-

ing a good beekeeper's season for 1889-90. In a great many localities white clover has failed to produce much nectar this season, and in places scarcely a bee has been seen to visit the blossoms. This is rather unusual, except in very high lying districts, and we think must depend upon some peculiarity in the season. The same absence of nectar has been reported from various districts, and with respect to very many honey-producing plants, that as a rule are certain honey-producers. Fruit trees and meadow flowers, however, gave a fair return in most districts and a promise of a good early summer flow. It has been very disappointing to many beekeepers, who looked for a good honey harvest from their clover fields and plantations of bee flowers, to remark day after day and week after week, while the plants were heavily covered with blossoms, the most unusual absence of the merry hum of the bees among them.

In October and November swarms of moths visited Victoria and New South Wales. The first-comers were day moths, often called butterflies, but the heaviest plague was from night moths: the former only take nectar from the flowers in the day time, and all honey plants were swarmed with them. From New South Wales we hear of great losses to beekeepers, which are attributed to the total appropriation of the honey flow by these visitors.

FEEDING BEES.—Our friend Mr. Abram in his welcome letter in our last number takes us to task somewhat severely, and we beg to apologise if we made any mistake. When speaking of his advocacy for Berlepsch hives, we hope we did not convey the idea of doing so disparagingly. As regards feeding also, Mr. Abrams entirely disagrees with us and with other beekeepers who feed with syrup. We are afraid beekeepers will never all agree on this point, although Mr. Abram has some very good and cogent reasons on his side, and we quite agree with him that it is bad beekeeping to extract honey from stocks as fast as they store it to fill the honey tank and then feed the bees with syrup when the honey flow ceases. Such a proceeding is inexcusable. But if from other causes, such as bad seasons, weakness of stock, &c., bees get short of food, they must be fed. We therefore quite agree that honey is best to give them if we can be sure it comes from a source free from infection; if not, we say feed with syrup which you know has no infection. Suspected honey, or honey from diseased stocks, if boiled, will be as Mr. Abram says, be rendered safe and pure, but *boiled honey* is as nearly the same as properly made syrup as we can well imagine.

Correspondence.

BEEKEEPING IN WEST AUSTRALIA.

To the Editor of the Australian Beekeepers' Journal.

SIR,—Thinking some news of beekeeping in Western Australia may interest some of your

readers, I send you the following notes of my experience:—

"I commenced three years ago, buying a few kerosene boxes with bees. The first season I did very well, had good increase and a good return in honey. I made my first hive after the Laugstroth pattern, but in January I found that as sure as I lifted a frame, the weight of honey caused the whole comb to tumble out. I then thought I would try the English standard size, and have had no cause to complain. I can handle the comb with impunity, and never have breakages. The second season, 1888-89, I started with 50 hives in standard frames, and expected a good harvest, but lo and behold the whole season passed away and no honey. The various gums did not blossom, or if they did, it was so small as to be of no account whatever. So the summer passed away and winter came, long, wet, cold, and very windy, and the result was 22 swarms died off, a result not very encouraging when one had expected to make a living out of the apiary.

The spring has opened now about two months later than usual: the bees have swarmed and bred something wonderful. I have now 54 hives in very good condition if only we have some settled weather; but here we are in December, and to-day is the fifth day of continued cold, windy and cloudy days. I have an extractor foundation machine and other requisites for carrying on the work. I make all my hives, and have sold about sixty besides. So far foul brood has not troubled me nor any of the friends I have started beekeeping. I am working mostly with hybrids; I find they are very good workers, though rather cross unless I give them a sufficiency of smoke before I open the hive.

I only got three queens purely fertilized last year out of 23 that I raised, and that commenced laying. I raised a great number, but lost very many, which I blame to the matins, as they are very plentiful here.

I am hoping for a good season and a fair return, as I cannot keep on with the bees unless. I must, before I close, say that I am exceedingly well pleased with your AUSTRALIAN BEE JOURNAL, and wish you every success. Yours, faithfully,

ROBERT KIRKMAN.

To the Editor of the Australian Beekeepers Journal.

DEAR SIR,—I am back again to my old place, and am starting beekeeping again on a small scale at first. I have bought a few hives in boxes. I let them swarm, hive them on shallow frames on the old stand, *a la* Heddon, cut drone brood and queen cell out of the present hive, then bore a few holes with a centre bit through the top in the box, and also some in the same places through the floor board of the swarm, and then fix the parent hive under the swarm. In this way I have all the bees in one hive, and three weeks after swarming, when all

maining brood is hatched, I shall remove the box from below the swarm, and use the comb for starting frames, &c. In this way I think I shall secure some good sections. What say you to this plan, Mr. Editor. I am yours very truly,
H. NAVEAN.

Hamilton, 19th Nov., 1889.

To the Editor of the Australian Beekeepers' Journal.

DEAR SIR,—Judging from all reports to hand the present has been a most trying season to the bulk of Victorian Beekeepers. The mild and early spring gave promise of good things; queens rapidly filled their hives with bees in August, but from that time forward it has been a hard struggle for a bare living with most beekeepers in the country districts, and in many places the loss from starvation has been heavy, while that from its attendant evil, foul brood, has been greater.

At the date of writing I have many reports to hand from various parts of the colony stating that although blooms are abundant no honey is forthcoming. This state of things will probably be improved upon as the weather becomes warmer causing a secretion of honey.

Foul brood has wrought havoc in many apiaries chiefly as the result of want of experience on the part of the apiarist, who, in the slack of the season must learn dearly to understand the symptoms he undervalued when things were rosy last season. No man need aspire to be an apiarist in Victoria until he has learned by dear experience what foul brood is and how to deal with it.

For handling and cleaning up diseased colonies I find one of the best things in use is a large sand boiler of about 40 gallons capacity, fitted with a large steam extractor made upon the principles of the "Jones Wax Extractor" as shown in the A.B.C. With this all combs may be quickly reduced, frames and fittings thoroughly scalded, and the work done in the evening when no bees are about.

There is no time so suitable as the swarming season for cleaning up any infected colonies. A week after the first swarm has left all queen cells being cut out and the operation being respected at the expiry of a second week (the bees being by that process rendered perfectly queenless) in which condition they may remain for a third week, thus allowing time for all sound brood to hatch out. The bees may then be clustered in a box with a caged queen, while the combs, hive, &c., may be thoroughly cleaned up. The bees being then returned to the hive supplied with lin. starters, the queen still being kept caged until work has been begun when she may be liberated. If no honey is coming they should be fed. In any case perhaps it would be as well to feed a little, adding 16 grains of salicylic acid to each quart of syrup given.

While on the subject of feeding, I beg to endorse what friend Abrams said in the last

issue. There is little necessity to feed bees if care is taken in breeding. Of this fact anyone who has had experience with blacks and Italians in the same apiary will be quite sure. It will generally be found that the Italians will hold their own and often store honey when blacks are starving. Only so late as the present season I have had experience of this fact in several places. The pure blooded Italians always showing to the fore. The same result might be produced from the black stock if the same care was expressed in selection as in the yellow stock, but taking the generality of black colonies they are not worth keeping.—Yours faithfully,

L. J. CHAMBERS.

To the Editor of the Australian Beekeepers' Journal.

SIR,—With your permission I wish to ask you an important question with reference to foul brood among bees. I arrived in Victoria last Fall, bringing with me a bive of Italian bees with an imported queen. Having located myself at Warragul, I made inquiries of several prominent gentlemen in the district about the welfare of our little friends in this part with the result that there appeared to them to be some mysterious cause of the bees dying off. Having been a beekeeper for 17 years I was, naturally enough, on the look out for the unknown trouble when this season opened up. The result of my investigations is, that of the two miles radius of country, which I may say I think I have examined thoroughly. I have examined the bives (all gin cases) of twenty-three beekeepers, in every case of which, without exception, foul brood exists. My own of five hives are also infected, and I have put them under treatment in clean hives, and burnt the old gear. My twenty-three new acquaintances (I beg pardon, I should say twenty-two of them) have met me very favourably, and promised under my direction to clean all up thoroughly, as they unfortunately know little or nothing about bees.

Having given you an outline it has brought me to my question, viz.: The twenty-third man is a Chinaman named Jimmy Ab How, who refuses point blank to have anything to do with cleaning up or permit me to do it for him, although I have offered to do it free of cost. I have also offered to pay him the price he gave for the hive, and then to burn it in his presence, but he is obdurate, and insists on being left alone in his filth. Can he be compelled by law or otherwise to rid his premises of the disease. He lives scarcely a quarter of a mile from me, and as I desire to let my cured bees take their flight on the 14th inst., it is necessary that he be dealt with by that time. Every one in the district will wait anxiously for your reply, which you will please kindly forward to—Yours truly,

E. WEBB,

Warragul.

Warragul, Nov. 8, 1889.

Extracts.

AMERICAN BEE-KEEPERS IN COUNCIL.

Abstract of Proceedings of Bee-Keepers Meeting at Chicago, October, 1889.

BEST SIZE OF SECTIONS.

The gist of the discussion was that the pound sections were the most desirable. Less than a pound was preferable to more than a pound, as the dealer would be asked to "throw in" an ounce or two over, while no fault would be found with a little lower price, as the result of a little less honey. All of Mr. Heddon's comb honey for this year had been stored in half-pound sections. He secured as much honey as when larger-sized sections were used, and it enabled him to get ahead of the farmers who brought in honey and sold it at a low price. His half-pound sections sold readily at 10 cents apiece.

PACKAGES FOR EXTRACTED HONEY.

Mr. Heddon—The pound sections made a success of the marketing of comb honey. The best package for retailing honey is glass. It should hold about one pound. The difficulty is with the price. It ought not to be more than one cent or ten. When honey was high, it did not matter so much. Honey has fallen in price more than glass has.

SUPERS FOR HIVES.

S. N. Black—I am using something like the old style of Heddon case. It does not exactly suit me, but I have not found anything better.

J. A. Green—No super is advisable that needs taking apart. I use a simple rim with tins nailed to the bottom of the ends to support the "section-holders." I think that wide frames without top-bars are preferable, as the bottom-bars will sag a little, which leaves a crack at the top in which the bees place propolis. There are no advantages in top-bars.

Mr. Heddon—If separators are not used, there is nothing better than my old style of super. With separators, the T-super is preferable. So far as working is concerned, I prefer my new style of case with wide frames, but the cost is against it.

Mr. Gibbs—I think that wide frames may cost the most, but they are the cheapest in the end, as I do not break so much honey in removing the sections. I think that separators are a necessity.

SURPLUS BEES.

Mr. Gibbs wished to know what to do with bees when he had more than he wanted.

President Miller advised uniting, and in the spring making stronger colonies.

Mr. Aspinwall said that the best yield he ever knew was the result of such uniting.

WHEN TO MARKET HONEY.

Mr. Gibbs said that most of the honey was sent to market too soon. It becomes soiled and stale from standing about, before the season is fairly open.

Mr. Heddon—People desire honey when the weather is cool—not much before. If sent to the market in large quantities before there is much demand, it aids largely in reducing the price. Small crates have advantages, less likelihood of breakage, and many are sold direct to consumers who would not buy a large crate of honey.

WHAT HIVE WILL PREVENT SWARMING?

J. A. Green—A large hive.

Mr. Heddon—With my hive and management, I believe that I can produce extracted honey with so little swarming that it will not pay to keep a man in each apiary all the time.

Mr. Aspinwall—I wish to mention the wooden combs in this connection. No bees have swarmed when occupying these combs. No drones can be reared, and I do not believe that the instinct of the bees will allow them to swarm when they can rear no drones to mate with the young queens.

THE UNFINISHED SECTIONS.

J. A. Green—Sections filled with foundation are finished sooner, and look nicer than partly-filled sections kept over from the previous season. One or two such sections in the centre of the super will answer as a "bait" to start the bees to work, but they will never be so fine in appearance; neither does the honey keep so well. It is more likely to "sweat," or ooze from the combs.

J. C. Wheeler—I have seen Mr. Green's honey, and these old sections really look poorer.

Mr. Heddon—A new, naturally built comb will be finished and capped sooner, when nearly ready to cap, than will one built on foundation.

President Miller—Perhaps Mr. Green does not succeed in having his sections entirely freed from honey the previous season.

J. A. Green—How do you get them cleaned?

President Miller—I pile the supers up out-of-doors, and leave a small opening, large enough for a single bee to enter. The combs will not be injured if only such a small opening is left.

J. A. Green—That is exactly the way I do.

Mr. Heddon—Dr. Miller, do you not teach your bees to become robbers and "snoops," by such management? If I were writing a book on bee-culture, I should lay it down as a principle, that, under no circumstances, should bees be allowed access to honey outside the hives. I would put the sections over a colony.

President Miller—I have never had any trouble in this direction.

Mr. Black—I should think that there would be considerable commotion and quarrelling around the entrance to the stack of supers.

President Miller—There is; but I do not know that it causes any trouble.

Chas. H. Green—I secure more honey by using the drawn combs. I extract them in the fall, and just at dusk put a case of them down at the entrance of a hive. The bees come out and clean up the sections.

Mr. Gibbs—I get the honey out, and the combs cleaned up in the same way that Dr.

Miller does. In the spring I break off the outside of the combs.

Several spoke of leaving the partly-finished combs until the dark honey harvest.

THE ZINC QUEEN-EXCLUDER.

Mr. A. I. Root said that the first size of perforated zinc that he made was too small; it troubled even the workers to get through. The next size was a little too large, and queens could probably squeeze through it. He now makes a size between the other two, which was probably the correct size. He said that he once had trouble with brace-combs being built to the bottoms of sections. He could not believe that a honey-board would allow him to take off a super, slick and clean, as Mr. Heddon said that it would. He thought that we all ought to be thankful to Mr. Heddon for his persistence in bringing the honey-board before the public.

Mr. Heddon called attention to the discussion that took place last winter at the meeting of the Michigan Bee-Keepers' Association, in regard to the number and size of openings needed in a honey-board. Two rows of perforations had proved sufficient. He believed that *one* row would be sufficient for a strong colony. One row of perforation in each strip of zinc was certainly more passage-way than was needed.

MARKETING HONEY.

R. A. Burnett—It is a fact that honey is sold only in a small way in warm weather. Honey does not carry so well in hot weather as in moderately cool weather. It leaks more, and soils the cases. October and November appear to be the best months for shipping. It is the privilege of the consignor to limit the price. It certainly relieves the commission man of much responsibility. Sometimes it results in gain, sometimes in loss. The pound section seems to have driven out about all other sizes. The 60-pound, square tin-can, jacketed with wood, is the best for shipping extracted honey. There is no leakage, and the honey is kept perfectly.

HONEY-BOARDS.

President Miller said that he had experienced some trouble the past season by bees building brace-combs above the slatted honey-boards. He could not say *why* they had done so. He looked upon the honey-board as a great invention, but had hopes that it might yet be discarded.

Mr. Heddon asked upon what he based his hopes.

The President could not say, but thought that more wonderful things than this had occurred.

Mr. Heddon did not believe that, so long as the instinct of the bees remained as at present, the honey-board would be discarded.

W. T. F. Petty reported that he had used thick top-bars, and very few brace-combs were built above them—so few that no honey-board was needed.

J. A. Green had had brace-combs built over all zinc honey-boards, but it was the result of their sagging.

Chas. H. Green had used top-bars $\frac{7}{8}$ of an inch square. It lessened the number of brace-combs, but not to such an extent that honey-boards could be dispensed with.

Mr. Heddon—When I began using the Langstroth hive, the top-bars were $1\frac{1}{8}$ wide, which made the openings between the top-bars a trifle over $\frac{1}{2}$ of an inch. I had much trouble by the bees building brace-combs and wax *between* the top-bars. I reduced the top-bars in width, and was surprised to see that less combs were built *between* the top-bars, but more above them.

A. I. Root had had the same experience. He reduced the top-bars in width, by cutting them down with a jack-plane.

J. A. Green—I once bought some bees in hives having frames with $\frac{1}{4}$ square top-bars. The bees filled the spaces between them with hard wax, and built just as many brace-combs above them, as in the other hives.

Mr. Heddon—I do not see how Dr. Miller can think that the honey-board will ever be abandoned. I would be just as glad as any one to lay it aside, but I do not see how it can be done.

President Miller—The experience of Mr. Petty is a pointer in that direction.

Mr. Heddon—Yes, but the experience of these other men is a pointer in the opposite direction. Then there is this much about it, what he calls a "few" brace-combs, I might call a good many.

Mr. Petty—I have 150 colonies, and I will admit that I never used the honey-board, simply because I have seen no necessity for it.

GETTING BEES OUT OF SECTIONS.

Some member said that he had read in the *American Bee Journal* that Mr. Heddon had some method of getting bees out of supers without removing the supers from the hive, and he would be glad if he would disclose this secret.

Mr. Heddon—I decline.

President Miller mentioned the plan of driving out as many bees as possible with smoke, then piling 8 or 10 supers on one hive, and having one person work the smoke vigorously upon the upper super, which will drive the bees down, when a second person snatches it off before the bees have time to return.

Chas. H. Green spoke of leaning the case against the side of the hive, and allowing the bees to crawl back into the hive. This is an excellent plan when robbers do not trouble.

J. A. Green spoke a favorable word for the "Reese escape."

Mr. Heddon was again urged to disclose his plan.

Mr. Heddon—Mr. President, may I speak right out in meeting.

President Miller—Yes.

Mr. Heddon—Well, this invention is partly that of my son, and so thoroughly has he been

impressed with the treatment that I have received in regard to my inventions—the disposition of a certain class to steal and claim them—that he declares that he will not suffer in this way—he will neither patent nor make public his discovery. I tell you, friends, the man who steals bread, goaded to the act by the sight of palid lips of starving wife or child, has an excuse; but he who steals the honor that belongs to another steals something that he cannot successfully use, something that fits him only as the armor of a plumed knight fits a pollywog, and is a thief by nature—

Here Mr. Heddon threw upon the table the handful of voting-blanks with which he had been gesticulating, and strode back to his seat. Later in the day a member said to us: "Mr. Heddon was a little 'ried' once to-day, wasn't he?" After a moment's thought he added, "But I don't know as I blame him any."

OVERSTOCKING A LOCALITY.

All agreed that a locality *could* be overstocked; then followed the question, "How many colonies is it profitable to keep in one locality?"

President Miller said that he was more deeply interested in this question than in any other connected with bee-keeping, unless it might be the prevention of swarming, but it was a question well-nigh impossible to answer definitely, because seasons and localities differed.

Mr. Heddon—I agree with Dr. Miller as regards locality, but not season. If there are blossoms enough to keep the bees busy visiting them, it makes no difference whether the season is good or bad. We must try to get the most money out of our field. Others must be kept out. If we increase the number of colonies until the field per colony is small, the less opportunity is there for some upstart with a dozen colonies. He can make no profit with his low yield per colony, but I can stand it, because of my large number of colonies. I think that 200 colonies, spring count, will give the best results, and, with the proper hives, tools, and system, one man can manage such an apiary.

Mr. Root gave several instances where large apiaries, notably in California and Wisconsin, had furnished great yields; but he admitted that there was no profit for any one in keeping bees near his large apiary in Medina. Every one who tried it, was obliged to give it up.

Chas. H. Green wished to know if bees right close to basswood did any better than those a little distance away. He had taken bees right into the basswood forest, and they did no better than those a mile and a half away.

Mr. Heddon once had a new swarm that stored 29 pounds and 13 ounces of honey in 24 hours, and the bees flew $2\frac{1}{2}$ miles; some of them 4 miles.

In regard to how many colonies it is profitable to keep in one locality, opinions varied all the way from 75 to 200.

ALSIKE CLOVER AS A HONEY-PLANT.

All agreed that Alsike clover is an excellent honey-plant, and for making excellent hay. It

is a profitable one for the farmer to grow. It is particularly adapted to low, moist land.

Mr. Root had furnished free all the seed that would be sown within $1\frac{1}{2}$ miles of his apiary; and at half price, that sown beyond $1\frac{1}{2}$ miles, and within 2 miles.

Mr. Wheeler.—The trouble is that the farmers cut it too early for it to be of much benefit to bee-keepers.

Mr. Heddon warned bee-keepers against this seed business. To give it away is wrong in principle. The moment that a farmer gets the idea into his head that your bees will get honey from his clover, then he does not wish to sow it. This is human nature. Let me tell you how I managed it. You know that I publish a local paper out at Dowagiac. Well, I sent to Mr. Newman for a cut of Alsike clover. Then I wrote an article on Alsike as a desirable crop for farmers to raise. I spread it on pretty thick, but I guess I did not stretch the truth any. But not a word did I say about its honey-producing qualities. Then I went to our seedsman and showed him what I had done, and induced him to put in a stock of seed. I then gave notice where the seed could be obtained. The result is that the farmers have sowed largely of the Alsike. Where a man has no paper to work with, and cannot work with some other fellow's paper, the next best plan is to get some old farmer interested, and let him do the talking.—*American Bee Journal*.

MODERN BEE KEEPING.

A HANDBOOK FOR COTTAGERS.

(Continued from Page 185.)

XV.—FEEDING.

Neglect of feeding is the occasion of the death of a greater number of colonies than all other causes put together; and intelligent attention in this matter does more than anything else to increase the harvest of honey.

Autumn Feeding.—If skeps at the middle of September weigh 20lbs. they may generally be considered heavy enough to stand the winter; but allowance must be made if the combs be old and heavy, when the weight ought to be more than that stated; but with frame-hives each stock, particularly if carefully wintered according to directions given further on, will be amply provided if it have about two superficial square feet of sealed honey. If the bee-keeper does not intend to extract his honey, poor hives may often be most conveniently assisted by exchanging one or two combs with their richer neighbours. In feeding to bring stocks up to the required weight, the syrup should contain 5lbs. of sugar to each quart of water. Let this syrup be taken quickly, or much of it will be employed for raising brood.

Feeding at the close of the honey-harvest has often for its object the raising of young bees. This is called 'stimulative feeding.' In this

case the food is given slowly, but very regularly, a gill more or less each evening; and the result is the encouragement of the queen in egg-laying, by which is raised a large population of young bees, which will live well in the succeeding spring, and keep the stock strong until other batches of brood are ready to take their place. The syrup used for brood-raising should contain about 3lbs. of sugar to a quart of water. Stimulative feeding should not be continued after the middle of September, when all stocks should be fed to the proper weight as rapidly as possible.

Winter Feeding.—Unless bees have been neglected in the autumn they will seldom require any attention during the winter; but should food then be necessary barley-sugar or candy can alone be given with safety.

Spring Feeding.—If bees are left altogether to themselves in spring there is very great risk of their running short of provisions, to their great injury; and even where this is not the case, they refuse to raise any very large numbers of young bees until honey begins to come in rather abundantly. By feeding regularly from the beginning of March, our stocks, if in good condition, rapidly grow stronger. For early swarms and strong rich stocks, able to gather surplus for sections and supers in summer, we must lay the foundation in the early spring by attentive feeding. All profit, all success, depends upon having our stocks *strong* when honey is plentiful in the fields and gardens; and to accomplish this the bees must be encouraged to breed vigorously *before* the honey comes. Syrups can be given to skeps over the hole in the crown from an inverted bottle, as described under the head of 'Feeder;' but, whatever the plan adopted, the syrup should be rather thin, as recommended for brood-raising in autumn. It is advisable to place the bottle on the hive in the evening after the bees have gone to rest, and if it contains no more than will be taken down during the night, the bees will increase the more rapidly. In addition to sugar, the food, afterwards described as flour-cake, will be immensely advantageous if used under the quilt. Where stocks have sealed store, we can stimulate to breeding by uncapping the cells with a dinner-knife. The honey will be carried into the brood-nest, and breeding increased in consequence.

Enlarging the brood-nest is most important at this season. It consists in very cautiously, as the bees are able to bear it, urging egg-laying, by putting a comb containing but little brood into the place occupied by a comb containing much, or by spreading the brood, and putting an empty comb in the centre. We must run no risk of chilling, but, short of this, the effect, if accompanied by gentle feeding, is quite beyond the belief of those who have not tried it.

Feeding Swarms.—Swarms do much better if fed even if the weather be favourable, but in wet seasons, or in comparative scarcity, it is a necessity. The feeding should be regular, but not excessive, as then too much drone-comb would be built. It should be continued for a

fortnight, when it may cease, as then the combs are nearing completion; and the brood the bees are able to cover is mostly sealed.

Feeding Weak Stocks must not be overlooked, and will often be required when strong ones are prospering. This in itself is an argument in favour of strong stocks.

Food.—The place of honey, the natural food of bees, is well supplied by syrup made as follows:—

Dissolve loaf sugar in water in the proportions previously given in a clean saucepan over the fire. Be very careful to prevent, by constant stirring, any burning of the sugar, as this forms a substance—caramel—very unwholesome to bees. Add a pinch of salt and a table-spoonful of vinegar to every 4lbs. of sugar, and if foul brood is known to exist in the locality, to the same quantity put in a heaped salt-spoonful of salicylic acid, and continue to boil gently a couple of minutes.

To make Barley Sugar, or Candy.—Into a saucepan or stewpan over the fire put a very small quantity of water ($\frac{1}{2}$ pint to 4lbs. of sugar), and keep the sugar constantly stirred, or it will burn. As soon as all the sugar is dissolved, let a drop or two fall on the plate. If this sets in a few seconds, so that the surface does not stick to the finger when it is pressed, it will do; if, however, it is sticky, it contains too much water, and either more sugar must be melted in it or boiling must be continued, to drive off the excess of water. The right condition being reached, remove it from the fire and continue to stir it very briskly, until it is evidently setting, when pour it into any convenient mould. The barley sugar so made, correctly named *candy*, will not be bright and clear like that of the confectioner, but it will be far better for the bees. The explanation of this, however, would require more space than could here be afforded.

Flour Cake.—If we require flour-cake we proceed as before, but carefully stir in 1lb. of pea-flour or wheat-flour for every 6lbs. of sugar either before or at the moment the latter is removed from the fire. We then stir briskly until stiffening commences, when we pour it into paper which has been placed in saucers or soup-plates. The hot sugar will settle the paper into form, while the paper will prevent sticking. In half-an-hour it will be hard, dry, and fit for use, and may be put over the frames of moveable comb hives between the combs of skeps. Its effect is most beneficial. When used with frame-hives the attached paper should not be removed, as this, placed uppermost, will prevent the flour-cake from sticking to the quilt.

XVI.—FEEDERS.

Great varieties of feeders have been introduced, but nothing is so generally satisfactory as a bottle inverted over a perforated zinc or vulcanite feeding-stage. For skeps or hives with crown-boards the stage will go over the central hole, but where the quilt is used a little wooden stage must be provided, as in fig. 6, pierced with a hole from 1 to 2 inches across. The bottle is filled, then over it is placed a small

shovel, or in the absence of a shovel a flat trowel, or even a piece of bent tin, zinc, or eard, and both are turned over, so that the bottle stands upon the shovel, as in the engraving A, fig. 6. The shovel is now placed upon the feeding-stage, the bottle grasped with one hand and the shovel slipped away with the other. The bees within pass up their tongues, and without leaving their cluster take down the sweets. Cover the bottle over, or robbing around its neck is likely to lead to robbing at the entrance of the hive. With skeps the rack described at page 51 can be used for feeding if we remove the sections and the strips of wood inside. The roof will shut in all comfortably, and prevent robbers getting at the syrup.

XVII.—ROBBING AND FIGHTING.

When honey is scarce and the weather open, stocks of bees are prone to rob one another. The usual indication of this is a good deal of excitement about the hive-door, while now and again two or three bees in fierce combat are seen to fall headlong from the entrance to the ground, where generally we shall find many dead or dying. Robbing is very quickly brought about at the times indicated, when the greatest care is necessary, as a little syrup spilt or access given to some food-bottle standing over a stock is likely to lead to the ruin of some of our colonies. We have said elsewhere that feeding with honey is particularly dangerous, and this is because its odour at once gives information of where it is placed. Should fighting have commenced the doorway must be made narrow and this will check the attack, but will rarely entirely stop it if the besieged stock has suffered much before our attention has been drawn to it. We have found that if the form of a tunnel be given to the narrow opening, the defenders have at once an enormous advantage, because as robbers pass into this they are met singly by guard after guard; and each combat, instead of giving the opportunity of entrance to those watching for it, as in the case of the narrowed doorway, simply blocks the opening, so that other would-be intruders are effectually kept out until the first have been ejected.

Carbolic powder from a dredger-top is most effectual in stopping the robbing if resorted to early in the day. The powder sticks on to the hairs, and is taken to the robbers' hive, and in a few minutes all will be gone and never return. A few of the defenders may be sacrificed, but it is worth this loss to stop the robbing. The entrance being contracted, few bees will come outside.

XVII.—UNITING.

It is often desirable to make two stocks into one. Perhaps both are weak, and separately are of little value, or unable to stand the winter, or one may have lost its queen at a season when she cannot be replaced. With swarms or casts the operation is easy; no preparation is needed if one has not come off more than a day or two before the other. In the evening blow a little smoke into the hive containing the older swarm

or cast, and throw the strangers down against the hive-door, in order that they may run in. Much of the success depends on the bees having their honey-sacs full, so that if a swarm should be discovered, which may have been waiting to be hived during the previous night at least, it will not be safe to attempt uniting it to another until the bees have been well fed or thoroughly sprinkled with thin syrup, time being afterwards allowed them for clearing it up.

Uniting established stocks requires more care.

We will first explain how to act with skeps should one or both of the skeps have just arrived from a distance. They may be placed close together, and united at once, as presently described. If two skeps which have stood in the same garden are to be joined, they must first be brought side by side by slow degrees, or many bees will be lost. Let their approach to each other be made by removals of not more than a yard each day, not reckoning those days upon which the weather has not permitted the bees to fly. When the distance between them is reduced to a couple of yards, drive the bees from the hive to be broken up; gently turn up the skep into which they have been driven, and sprinkle with thin syrup (thick syrup would gum the bees, to their great injury), which most bee-keepers scent with peppermint, cloves, or nutmeg. Smoke the bees which are to receive them, and lifting their hive, sprinkle them between the combs with syrup scented as in the case of the others. After an interval of a few minutes give another puff of smoke, sprinkle again, and putting down the skep between the two stations which the bives previously occupied, and propping up its edge, throw the driven bees down against its entrance upon a large board, newspaper, or sheet, as explained under the head 'Swarming.' Some recommend that both stocks of bees be driven out, and united while absent from the combs, scented syrup being used both in the case of the bees and the hive of combs intended to receive them. To unite bees in frame-hives attention to position will be as necessary as in uniting skeps, as described above. Outside unoccupied frames, from the hive to receive the addition, being removed, the bees are smoked, and their frames drawn together, scented syrup being used as with skeps. The smoking and scenting are repeated with the second hive, and if one of the queens can be utilised she is of course taken away. If both queens are not required, and one is known to be a better breeder than the other, destroy the inferior one. The frames are now lifted out one by one, and put in proper order beside the other frames in the first hive, keeping all the brood in the centre for warmth, then, brushing off all the rest of the bees left on the combs for which there is no room, and, covering up all, our work is complete. Should fighting commence, a free use of smoke and rapping upon the hive side will restore order. Since sometimes, although rarely, the one queen left is killed, it is a wise precaution to cage her for forty-eight hours.

(To be Continued).

INTELLIGENCE OF THE HONEY BEE.

(BY CHARLES DICKENS.)

The wonderful working and production of the honeybee when we view the interior of a beehive fills one with wonder and astonishment. We behold there a miniature city, regular streets disposed in parallel lines consisting of houses constructed upon the most exact geometrical forms. These buildings are appropriated to various purposes; some are storehouses in which provisions are stored in enormous quantities, some are the dwellings of the citizens, and a few of the most spacious are royal palaces. We find that the material of which this city is built is one which man with all science and skill cannot fabricate, and that it is employed to form edifices, such as the most consummate engineer could not reproduce, much less originate; and yet these wonderous productions are the result of the labor of a society of insects, so small that four thousand of them will only fill a quart measure. Nor has the problem thus solved by the bee yet been satisfactorily expounded by the most clever men. Its mysteries have not yet been fathomed. In all ages the attention of naturalists and mathematicians has been engrossed by it. Nevertheless, the honeycomb is still a miracle. Besides the saving of wax effected by the form of the cells, bees adopt another economical plan suited to the same end. They compose the bottoms and sides of wax of very great tenuity no thicker than a sheet of paper, but as walls of this thickness at the entrance would be perpetually injured by the ingress and egress of the workers, they prudently make the margin of the opening of each cell three or four times thicker than the cells. I need not refer to the perfect and well-known geometrical construction of the cells of a hive as evidence of design and high instinct. These cells combine the greatest amount of strength with the least expenditure of material and room that we are aware of. The equilateral triangle, the square and the hexagon were the only three forms of tubular cells that would leave no interstices. In the first form, however, there would be a lost space in each angle; a similar disadvantage would be found in the second, but not in the third. In the exercises of engineering powers demonstrative of mind, or by an instinct, surely Divine, the bees have adopted the last or hexagonal form.

When left to act at will, bees show a remarkable intelligence in selecting and preparing a place in which to live and store their food. They never select a dead tree, seeming to know it is liable to fall at any time and thus destroy their home, but always select a live tree with a hollow centre that has a crevice for an entrance. The inner lining of such a tree would usually be of a pithy nature, which is a poor conductor of heat. Surrounded by this material they are protected against extremes of weather both in summer and in winter. After selecting the tree, which is always a good one, and capable of standing for a long time, they prepare the inside by removing all loose particles that are

not too large for them to handle; and those that are too large they glue solid with propolis, which is a product of various resinous buds. They also stop all crevices, except the main entrance, with the same substance, thus making the interior firm and warm. The tree, now, is in such condition that they can attach their comb to the interior and store it with honey. What seems to be intelligence is also shown in the way they ventilate their homes, and at the same time reduce the temperature when it becomes too warm for the wax, of which the comb is made. It has been determined that wax possesses the greatest tension at a temperature of 100 degrees Fahrenheit, and at this temperature, with a range not exceeding two degrees, bees keep the interior of their hives by devices of their own. On a hot sultry day there may be seen successive lines of bees taking up their position at the mouth of the hive, joining the tips of their wings and working the fans thus formed for ten minutes or more, and then retiring in order that the second line may come to the front and repeat the process, and these are followed by the other lines in succession. The observer has also noticed the fact that when a hive has been removed from a locality with which its inhabitants have become familiar, they, upon the next day (having been removed in the evening at dusk) before leaving for their usual labors, fly around the hive in every direction, similar to carrier pigeons, as if to observe the surrounding objects and obtain a general acquaintance with the new neighbourhood. They then go their work, and after gathering their load of sweets from the flowers, a similar circling and manœuvring is noticed, as if to get the right direction back to their home. This fact shows traces of intelligence rather than those of instinct, inasmuch as the recognition of their home depends not on any character merely connected with the hive itself but from its relation to surrounding objects. Bees have been known to travel from five to seven miles from their home in search of food. Each bee in the hive has its individual work to perform, and as such, it is always accomplished, and hence we must infer that a willingness of spirit accompanies the labor. No intrusion upon their rights or home is allowed, though bees never act except upon the defensive. The closer one observes their habits the more wonderful do they appear, indicative of both reason and intelligence. What lessons may be drawn from their study—lessons of patience, of industry, of forbearance, of economy, and care for the future! One has only to go these apparently insignificant objects of nature to find displayed in them a very high degree of perfection—

"Creatures that by a willing nature teach
The art of order to a peopled kingdom."

—*Mildura Cultivator.*

DOOLITTLE ON QUEEN-REARING.

Queens can be reared in the upper stories of hives used for extracted honey, where a queen-excluding honey-board is used, which are as

good, if not superior, to Queens reared by any other process; and that, too, while the old Queen is doing duty below, just the same as though Queens were not being reared above. This is a fact, though it is not generally known.

By employing these methods, colonies are never queenless, and no queenless bees need be bothered with, by uniting them with other colonies, or otherwise.

If you desire to know how this can be done—how to have Queens fertilized in upper stories, while the old Queen is laying below—how you may safely introduce any Queen, at any time of the year when bees can fly—all about the different races of bees—all about shipping Queens, queen-cages, candy for queen-cages, etc.—all about forming nuclei, multiplying or uniting bees, or weak colonies, etc.; or, in fact, everything about the queen-business which you may want to know, send for "Doolittle's Scientific Queen-Rearing," a book of 180 pages, which is nicely bound in cloth, and as interesting as any story. Price, \$1.00.

An edition in strong paper covers is issued for premiums. It will be mailed as a present to any one who will send us two new subscribers to either of our JOURNALS.

FALL WORK.

UNITED COLONIES IN THE FALL OF WINTERING.

Written for the American Rural Home,

BY G. M. DOOLITTLE.

As the season of 1889 has been rather unpropitious for bees in some sections of the country where only white honey is the source of supply, some bee-keepers now find that their colonies have not the necessary number of bees or the necessary amount of stores to give promise of successful wintering; hence they ask what they are to do under such circumstances.

If the colonies were strong in bees, the question might arise whether it would not pay to buy sugar, even at the present high prices, and feed the bees so as to have a greater number next spring, but where colonies are both light in bees and in stores, there is only one correct solution of the problem, which is, to unite the bees till all are strong, and then if stores are still lacking, they may be fed.

There have been many plans given for uniting bees, some of which are too laborious to be tolerated, such as moving colonies little by little each day until they are brought together, carrying them to the cellar for a few days, etc.; the advocates of these plans claiming that by their use none of the bees will return to their former location, yet I find that the more simple plans do just as well where a little precaution is taken by way of removing all signs of the former home from the old stand.

The plan I use, and one which has always worked well with me, so far, is as follows: Having decided that certain colonies are to be united, the first thing to know is, which of the two or three, as the case may be, has the most

valuable queen. Having ascertained this, I hunt out the poorest and kill her, then take the hive or hives from which the queen has been killed, to the stand of the one they are to be united with.

I now select from each hive the frames having the most honey in them, to the number I wish to winter them on, and set them in one of the hives, alternating them as they are set in the hive.

In moving the bees they are jarred by placing the hives on a wheel-barrow in no gentle manner, and wheeling them rapidly to the place they are to stand, first having confined the bees to the hive, and doing the whole on some cloudy day when the bees are not flying, which causes them, in a measure, to forget all about their former home in their anxiety for the present; and also causing them to remain on their combs much better in handling them than would be the case were they not thus disturbed, so that in the process of uniting, very few bees take wing in comparison to what otherwise would, and these few are so bewildered that they immediately go in with the others in the new hive or united colony.

Having the hive full of the combs containing the most honey, I next stake the bees, which are on the remaining frames, off at the entrance, taking one frame from one colony, and the next from another, and so on, so as to mix the bees up as much as possible. When all of the bees are inside of the hive, the work of uniting is done. Remove the hives, bottom-boards and all from the stands occupied by the united colonies previous to this, and no loss of bees will occur.

What few bees go back to the old stands, return after finding their old hives gone; also the mixing-up process spoken of above, causes them to mark their location anew, at their first flight afterward, the same as does a new swarm, or when the bees take their first flight in the spring.—*American Bee Journal*.

Borodino, N.Y.

CANADA.

The products of another year have been gathered in, and the labours of the bee-keeper for the season are nearly ended. With us in Ontario the result on the whole is satisfactory. The yield of honey has been fair, while increase in stock has been abnormally large; moreover the demand for honey has been unusually brisk, and prices good. Year after year we hear complaints of the season's yield not being up to the average. We are told by some people that this year's honey crop is below the standard. What an average crop is I have yet to learn. If my report as above made be correct, let us accept this season's results as an average or standard by which we may compare future harvests—call it average, I am satisfied to have it settled as such, and think my brother bee-keepers have no good reason to dissent.

Not only is the harvest ended, but the public exhibitions of the season's products are also past. The *B.B.J.* furnishes us with full reports of these shows on your side of the Atlantic, and

from these we learn that your method of conducting them differs somewhat from ours. You have systematised the work to a degree, while the most marked feature of ours is their magnitude. A pound of honey with you is represented by about a hundred pounds with us. We think it not matter for surprise for an exhibitor to display from one to three tons, your system may ensure fuller justice to the exhibitor, but is not as good a means of advertising as ours. You have formulated an elaborate scale of points by which honey is judged—we have no very arbitrary rules to guide the judges to a decision. The basis upon which awards are made at our shows is mainly confined to three points. For extracted or run honey these are—flavour, colour, and consistency. For comb—finish, colour, and cleanliness. Some of the distinctions you make in run honey are so nice and delicate that I fear we would have difficulty in deciding upon, or even distinguishing between them. I find you embrace amongst these 'consistency' and 'density,' also 'flavour' and 'aroma.' I am not well qualified to be hypercritical. To my thinking, the relative density of honeys can only be correctly ascertained by instrumental tests, and I doubt if this is ever done at shows. Consistency is the medium through which its density is determined. With us, at any rate, this is the case. When bottled its density changes but little, while a higher or a lower temperature will rapidly change its consistency. Under like conditions, however, the consistency will remain relatively the same. In the scale of marks Mr Gibbons gives aroma two and flavour one, while Mr Chenevix gives flavour five and aroma one. Aroma is perhaps the best test in determining the class of flowers from whence the honey was gathered, and therefore the best in classifying it, but flavour is more important in fixing its commercial value. Moreover, aroma is fleeting in its nature, while flavour remains a permanent quality. Therefore, I think flavour remains a permanent quality, and should be rated higher than aroma. I do not presume to fix a scale of points by which the product of the British bee-keeper shall be judged, but the subject is so interesting to me that the perusal of 2312 and 2313 in the *B.B.J.* called up the foregoing thoughts. I fully endorse Mr Chenevix's statement that 'attractive appearance is of extreme importance in making the commodity marketable.' Its force must be felt in the pocket of every man who produces honey and puts it on the market. It is recognised by all classes of business men as essential to success that the goods they offer for sale be presentable in appearance and neat in their get-up.' This brings me to the consideration of honey bottles, I am glad your correspondents are taking this matter up. We have not yet got just what we require and what we ought to have, viz.: bottles at once pleasing in form, correct as to their capacity, and safe to strip to outside points when filled. You are much ahead of us in their design and quality, but you have not yet an entirely satisfactory range of honey-glasses. I speak of them from experience, for of late years I have used some

thousands of your English honey-pots. Probably there is not a style of honey-glass made or used in England I have not tried. I have used English and French glass exclusively doing the last three years, and few, if any of them, fully 'fill the bill' in my trade. I ship most of my honey to distant points on this continent; some of my regular customers live 1500 to 2000 miles apart, and I require glass pots at once neat, safe, and serviceable. Your pots are divided into two classes—screw-tops and tie-overs—both are defective in one or more particulars. The greatest defect in most of the screw-tops is not so much that they leak at the top when turned bottom up, but that the honey oozes through the glass itself, making the bottles unsightly and disagreeable to handle. I have found this defect greater in the French than in the English bottles. They appear to be too thin just where the body of the bottle springs from its bottom. I have not found it to exist in the English tie-overs. The tin cover of the English screw-top is too coarse, and not well finished. The French bottle is much better in this respect. I think if thin rubber rings were substituted for cork wash in all screw-tops, it would effectually prevent leaking. I cannot make a satisfactory finish on tie-overs without using capsules, when these are employed together with corks and parchment it increases the cost and the labour as well. With me all three are essential to a safe and satisfactory finish.—R. McKNIGHT, Owen Sound, Ontario, Oct.

BEE-KEEPING IN SOUTH AFRICA.

The method of bee-farming, as it is carried on here, says a correspondent to *Gleanings*, is as follows:

A native cuts a circle in the bark of a tree, and about three feet above he cuts another. Then he cuts in a straight line from one circle to another, and strips off the entire bark as cut. While this is still green, he refolds it in the shape of the tree, and carefully sews up the centre seam, and after folding the two ends in a more or less square form, he sews them up, leaving an entrance for the bees. His thread is bark, and his needle is a thorn, and his punch is his spear. This is his bee-hive, and it seems to do excellently for this class of bees.

The forests all about are well provided with these hives, placed in the tree tops, and it seems that the greater number of these hives sooner or later become inhabited with bees. The bees here are not so large as the honey-bees of North America, nor are they much smaller.

Swarms that have alighted about the house from time to time are about the size of a half bushel. Honey here is in abundance and very cheap. Honey is 10 cents a bucketful (three gallons.) Comb honey we never see. The matter of extracting honey is simple with the African; he simply cuts out the combs, and with his hands squeezes out the honey. The honey is of a richer quality, and much thicker than any I ever saw in America. Probably the climate is the chief agency in ripening the honey to so fine a state.

BEEKEEPERS' JOURNAL FOR OCTOBER.

This is always considered to be the swarming month, consequently the hives will require constant care and attention. Where many are kept the apiary should never be left unwatched during fine days. Excessive swarming may be expected this season, as everything is favourable for enabling bees to rear large quantities of brood. The growth of the Cape mangold is phenomenal, and the abundant moisture will ensure the flowers of this weed lasting for a considerable time. Around Adelaide bees are simply revelling in these flowers, and are filling their combs with the rank honey. Whilst this plant continues in bloom swarms of bees may be hived without any trouble being taken in regard to feeding. If comb foundation is given, combs will be rapidly built for the reception of brood and honey, but the hives should be regularly inspected about once a week in order to see that everything is proceeding in a proper manner. The foundation often gets twisted and bent through the heat of the hive, but this can easily be corrected by the beekeeper during the progress of comb building. The advantage of straight combs well repays any little trouble taken in this way.

Queen-rearing can now be entered into with a certainty of success. There are many methods of doing this, but we will only describe one that can be carried out by any beekeeper who uses the Langstroth or other frame hive. Having selected a strong colony for building the queen cells, the bees should have some smoke blown in amongst them and the queen removed. She can be given to a queenless hive or used where required. The combs are then carefully examined and all which contain uncapped brood should be removed. This hive we will call the queen-rearing hive. Now go to the hive containing the very best queen in the apiary and select a comb in the cells of which can be seen the tiny larvae just hatched from the eggs. These larvae appear four days after the eggs were laid, and can only be seen by careful inspection, but it is absolutely necessary to get them at the right age—that is the day they emerge from the eggs. (If there is difficulty in doing this, select a comb containing eggs only.) Having shaken the bees off this comb, three long strips about one inch wide are cut out with a sharp knife, and these strips are fastened with melted wax to the underside of three ordinary frames. This should be done in such a way that the weight of the bees cannot pull the strips of comb away from the frames. These frames with the prepared strips are now placed in the centre of the queen-rearing hive, which, as described above, has been deprived of its queen and young brood. Three days after this operation an examination should be made, and several queen cells will be found nearly completed. On the fourth day—that is eight days from the time the eggs were laid—the cells ought to be completely sealed up and finished. On the eleventh day the queen cells should be carefully cut out and distributed amongst queenless colonies that have been prepared for their reception. In fixing a queen cell in one of

these colonies it is best done by placing it in the natural way with the pointed end downwards between the top bars of two frames and holding it in position by gently pressing the frames together. On the twelfth day—that is sixteen days after the eggs were laid—all the queens should emerge from the cells. Ten days after the queens emerge they should be laying, and three weeks after that young bees ought to appear. The great advantage of rearing queens from one queen mother in this way is that the beekeeper is breeding from his best colony, and each year will tend to improve the qualities of his bees.

A practical illustration will show how these young queens may be used at this season. For instance, it is desired to prevent a colony from swarming and at the same time increase to two colonies. The original hive is moved to another stand and a new hive is placed on the old stand. Two or three frames are removed from the original hive, the bees are brushed off, and these frames are placed in the new hive. A young queen is caged in the new hive; the old bees flying back to the old stand soon form a goodly cluster, and when two days afterwards the young queen is released it will be found that there are two excellent colonies of bees that will as a rule give over swarming for the season.—*Garden and Field.*

BEES AND CAPE MARIGOLD.—Mr. Naismith reported that his bees were doing well, and he had already secured 27 swarms. Some of the colonies had filled the boxes with honey, but it was unfortunately taken from the Cape Marigold (*Cryptostemma calandulacea*), which is so strongly tasted that it is hardly fit for use. He thought it might do to feed back to the bees in time of scarcity. [The honey from Cape Marigold is generally fed back to bees in winter. It will also serve to make honey vinegar, which is the best vinegar for all purposes. From one to three pounds of honey should be stirred into each gallon of water (according to strength required), then let the mixture stand exposed to air from three to six months, when the vinegar is fit for use. By placing a cup of good vinegar over the bunghole, and placing threads of worsted communicating between the vinegar and the mixture of honey and water, the process is greatly hastened.]—“*Garden and field.*”

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